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A
DESCRIPTIVE CATALOGUE
OF THE
NAIADES, OR PEARLY FRESH-WATER MUSSELS

Division of Mollusks
Sectional Library

BY
CHARLES TORREY SIMPSON

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PART III

UNIONIDÆ,
HARMANDIA — DIPLODON
MUTELIDÆ

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DESCRIPTIVE CATALOGUE OF THE NAIADES

PART III.

Division of Mollus
Sectional Library

Genus HARMANDIA Rochebrune, 1882.

Harmandia Rochebrune, Bull. Soc. Phil., VI, 1882, p. 45.

Shell subtrapezoidal, subalate, rather thin, posteriorly compressed, with low beaks and irregularly radial sculpture, a few of the ribs converging at the center of the disk, the rest becoming divaricate and covering the shell, those of the posterior slope springing from the rib on the low, posterior ridge; epidermis gray-green; left valve with two arcuate, compressed, elongate pseudocardinals in front and a triangular cardinal under the beak, the right with two pseudocardinals in front and a pit under the beak; there are two nearly straight, lamellar laterals in each valve, and a small, up-curved lamella above them near their posterior end; anterior muscle scars deep; nacre white, brilliant, showing the outside sculpture.

Animal unknown.

Type, *Harmandia somboriensis* Rochebrune.

Harmandia somboriensis Rochebrune.

Shell subrhomboid or imperfectly triangular, considerably narrower in front, subcompressed, rather thin, inequilateral; beaks moderately elevated, somewhat pointed, their sculpture apparently subradial; anterior end narrowly rounded, almost pointed; base line lightly curved, somewhat fuller behind the middle; dorsal outline almost angled at the beaks, nearly straight in front of and behind them; posterior slope obliquely truncate; posterior ridge low, ending behind in a feeble biangulation; surface sculptured with strong, irregular, subradial ridges, which are heaviest on the middle of the disk; epidermis grayish-green; anterior pseudocardinal of the left valve elongated, convex, double; posterior subtriangular and connected with the long straight laterals; right valve with two oblique, lamellar pseudocardinals; each valve with two long laterals and an additional lamella branching and curving upward from near their posterior ends; nacre pearly, shining.

Length 49, height 28, diam. 16 mm.

Rapids of Sombor-Sombor, Mekong.

Harmandia somboriensis Rochebrune, Bull. Soc. Phil., VI, 1882, p. 46, pl. 1, figs. 1-3.—Simpson, Syn., 1900, p. 827.—Haas, Conch. Cab., Unio, 1912, pl. 31, fig. 10.

A remarkable shell with very strong, subradial sculpture, the heavy ribs in front of and behind the beaks coalescing below. The upper lateral in each valve bifurcates near its posterior end, the small upper part curving away from the main lateral.

Harmandia castelneaui Rochebrune.

"Shell compressed, subovate, solid, brownish-gray; above straight; below obliquely convex; anterior end short, nearly straight, pointed, point obtuse, conic; posterior end expanded in a broad, thin, compressed wing; surface radiating costate, anterior ribs eight, straight, oblique, granular above; posterior ribs five, wide, curved, laminated, set at an angle with those of the anterior region; the interval between the ribs circularly striate with heavy, undulating striæ; cardinal tooth in the right valve oblique, jagged; in left valve subexcavated; anterior lateral very short, nearly straight; median the longest, subconcave, angulated; posterior short, straight; umbones very short, eroded; nacre of a bluish lead-color, very brilliant.

Long. 52, lat. 32, crass. 12 mm." (Rochebrune).

Type locality, Cochin China.

Harmandia castelneaui Rochebrune, Bull. Mus. Hist. Nat., 1904, p. 139.

Harmandia castelnaui HAAS, Conch. Cab., Unio, 1912, pl. 31, figs. 11-12.

"The *Harmandia castelneaui* differs from the *somboriensis* by its slightly larger size and thicker valves; by its anterior end not concave and almost oval, but short, straight, and with an obtuse, conical point; by its dorsal margin expanded in a large angulated wing, not short and obliquely rounded; by the great number of ribs, the anterior ones narrow, straight, granulated, reaching the ventral margin, and not squamose and broken in the central part by a deep groove: the posterior ones oblique, large, projecting, with large, imbricated scales, not finely granulated; by the inter-costal space ornamented with heavy, not fine, striæ; by the right cardinal tooth being oblique and deeply sulcate, not pyramidal and sulcate on the inner side; by the lateral teeth, of which the anterior is very short, almost straight and not concave, and the lower straight and not as long as the median; and finally by the color of the nacre, which is a very brilliant, bluish lead-color, not pure white."

Haas, (l. c.), considers this a synonym of *H. somboriensis*.

Genus GRANDIDIERIA Bourguignat, 1885.

Grandidieria BOURGUIGNAT, Bull. Soc. Mal. Fr., II, 1885, p. 6.

Shell small, oval, rounded or rhomboid, solid, much inflated, generally narrowly biangulate behind, often apparently of two forms, one more inflated in the basal and post-basal parts than the other; beaks high, curved forward and inward and pointed, very delicately and beautifully sculptured with zigzag liræ, which become finely nodulous and sulcate on the disk, especially in front and behind; posterior ridge well developed, often slightly double; hinge line curved; two pseudocardinals in the right valve separated by a parallel-sided socket, one or two in the left, with often an irregular, triangular, ragged tooth under the beak, which is frequently reflexed; one obliquely striate lateral in the right valve and two in the left; nacre of peculiarly soft, rich texture, white, coppery, or purplish, delicately radiate; beak cavities moderate; muscle scars distinct.

Type, *Unio burtoni* Woodward.

A group of small Uniones, which seems to be confined to Lake Tanganyika in Tropical Africa. Most of the species have well marked, concentric sculpture which shows a tendency to become wavy or zigzagged, and it often becomes granulous. Quite commonly the pseudocardinals are reflexed and considerably ragged. The group from conchological characters seems to be closely related to the African species, which I have placed in *Parreysia*.

I would not be surprised if, when the anatomy of the Grandidierias is known, it may be found that all four gills of the female contain embryos when gravid as, apparently, is the case in *Parreysia*. The beak sculpture of many of the Quadrulas closely approaches that of the *Endobranchiæ,* and there may be a sort of connection between *Quadrula, Physunio, Parreysia, Grandidieria* and the Endobranchs in general.

KEY TO SPECIES OF GRANDIDIERIA.

- Shell nearly smooth, rayed. *G. tanganyicensis.*
- Shell sculptured, rayless or nearly so.
  - Short elliptical, strongly sculptured. *G. burtoni.*
  - Ovate.
    - Rather short, biangulate behind. *G. gravida.*
      - Pointed behind. *G. smithi, rothschildi, thomsoni.*
    - With full beaks, much drawn out behind, *G. rhynchonella.*
    - Narrowed and drawn out in front and behind, *G. callista.*
  - Decidedly rhomboid. *G. bourguignati.*

GRANDIDIERIA BURTONI (Woodward).

Shell short, elliptical, subsolid, inequilateral, convex or subinflated; beaks small, moderately elevated, turned forward, pointed, their sculpture appearing to be very faint corrugations; posterior ridge low, rounded, having two feeble, raised, radial ridges above it, ending in a blunt point about on the median line; surface with three patterns of sculpture consisting of irregular, concentric ridges, faint, radial impressions and fine, chevron-shaped bars, which break up more or less into nodules or granules; epidermis thin, pale brownish or whitish, not shining; pseudocardinals somewhat split up; anterior scars impressed; nacre silvery white to purple.

Length 26, height 18, diam. 14 mm.

Lake Taganyika.

Unio burtoni WOODWARD, Proc. Zool. Soc. Lond., 1859, p. 349, pl. XLVII, fig. 2.—SOWERBY, Conch. Icon., XVI, 1866, pl. XLVII, fig. 251.—SMITH, Proc. Zool. Soc. Lond., 1881, p. 297, pl. XXXIV, figs. 33, 33*b*.

Margaron (Unio) burtoni LEA, Syn., 1870, p. 31.

Grandidieria burtoni BOURGUIGNAT, Bull. Soc. Mal. Fr., II, 1885, p. 6.—SIMPSON, Syn., 1900, p. 828.

Grandidieria cyrenopsis BOURGUIGNAT, Bull. Soc. Mal. Fr., II, 1885, p. 9, pl. I, figs. 7-9; Icon. Mal. Tan., 1888, pl. XIX, figs. 1-3.

Woodward's figure, which agrees well with shells in the National Museum collection, shows this a short shell, a little full in the post-basal region and very bluntly pointed. The epidermis is sometimes almost silky. The sculpture is sometimes quite faint. According to Smith the nacre varies from white to coppery-purple.

Var. *servainiana* Bourguignat.

More circular in outline than the type, almost as high as long, with stronger sculpture.

Lake Tanganyika.

Grandidieria servainiana BOURGUIGNAT, Bull. Soc. Mal. Fr., II, 1885, p. 6.

Unio burtoni var. *servainiana* VON MARTENS, Besch. Deuts. Ost-Af., 1897, p. 238.

Grandidieria burtoni var. *servainiana* SIMPSON, Syn., 1900, p. 828.

Var. *insignis* Bourguignat.

Almost equilateral, triangular, reminding one of the form of *Spisula solidissima;* lower edge moderately rounded.

Lake Tanganyika.

Grandidieria insignis BOURGUIGNAT, Esp. Ouk. Tan., 1885, p. 16.

Unio burtoni var. *insignis* VON MARTENS, Besch. Deuts. Ost-Af., 1897, p. 238.
Grandidieria burtoni var. *insignis* SIMPSON, Syn., 1900, p. 828.

Var. *sturanyi* (von Martens).

Shell more depressed and more convex than the typical form; nacre yellowish-gray or reddish-gray, iridescent.

Lake Tanganyika.

Grandidieria STURANY, Baumann, Durch Massailand, 1894, p. 6, pl. XXIV, fig. 31; XXV, fig. 35.
Unio burtoni var. *sturanyi* VON MARTENS, Besch. Deuts. Ost-Af., 1897, p. 238.
Grandidieria burtoni var. *sturanyi* SIMPSON, Syn., 1900, p. 828.

The above forms have, with one exception, never been figured, but are placed by von Martens under *burtoni* as varieties. I know nothing about them but give them on his excellent authority.

GRANDIDIERIA TANGANYICENSIS (Smith).

Shell small, irregularly oval, solid, somewhat inflated and inequilateral; beaks full and high, turned inward and forward, sculptured with fine, zigzag-radial corrugations; lunule indistinct; anterior end narrowed and rounded; base line well curved, a little fuller just behind the middle; posterior ridge close to the dorsal line, narrowly rounded, the whole curved slightly to a point behind on the median line; surface finely and unevenly concentrically sculptured and often having traces of radial sculpture; it is also more or less overlaid with delicate granules arranged as if engine-chased; pseudocardinals rather solid, ragged; nacre whitish, liver-colored or purplish, sometimes coppery, often lighter on the border; epidermis greenish or ashy-brown, often densely rayed.

Length 24, height 18, diam. 12 mm.

Lake Tanganyika.

Unio tanganyicensis SMITH, Proc. Zool. Soc. Lond., 1880, p. 351, pl. XXXI, figs. 9, 9*a*; 1881, p. 298, pl. XXXIV, fig. 35.
Grandidieria tanganyicensis SIMPSON, Syn., 1900, p. 828.
Grandidieria tanganikana BOURGUIGNAT, Bull. Soc. Mal. Fr., II, 1885, p. 7.

A neat little species, which seems to show considerable variation. The specimen first figured by Smith is decidedly rayed; another figured later by him in the P. Z. S. 1881, pl. XXXIV, fig. 35, is rayless or nearly so. Four valves forming two matched pairs of what I believe to be this are in the collection of the National Museum and are formed exactly like the figures of Smith and show a transition from the almost smooth, rayed form, which is somewhat shining, to that which is dull-colored, rayless and corrugated throughout. Specimens from Ancey said to be labeled *Unio hauttecœuri* by Bourguignat are without doubt the above, and quite different from Bourguignat's species.

GRANDIDIERIA SMITHI Bourguignat.

Shell suboval, rather solid, subinflated or convex, inequilateral; beaks moderately elevated, turned forward, with fine, subradial, somewhat zigzag sculpture; posterior ridge rounded, ending in a decided but blunt point behind; above it are two dark, slightly raised, radiating ridges; surface with concentric, finely radial and zigzag, sub-nodulous sculpture; epidermis dull, pale brownish; pseudocardinals ragged; anterior scars impressed; nacre whitish to coppery-purple, and often lighter colored at the edge of the shell.

Length 32, height 24, diam. 14 mm.

Lake Tanganyika.

Unio burtoni SMITH (part), Proc. Zool. Soc., 1881, pl. XXXIV, fig. 33*a*.

Grandidieria smithi BOURGUIGNAT, Bull. Soc. Mal. Fr., II, 1885, p. 7.—SIMPSON, Syn., 1900, p. 829.

Unio burtoni var. *smithi* VON MARTENS, Besch. Deuts. Ost-Af., 1897, p. 238.

Grandidieria anceyi BOURGUIGNAT, Esp. Ouk. et Tan., 1885, p. 15; Icon. Moll. Tan., 1888, p. 43, pl. XIX, figs. 4-6.—SIMPSON, Syn., 1900, p. 829.

I am inclined to think with Bourguignat, who separated this from *burtoni,* that it is a valid species. A specimen in the National Museum agrees very accurately with Smith's figure

33*a* in the P. Z. S. referred to above, save that its beaks are not quite so large as there figured. It seems to be a larger shell and the hinder end is more decidedly drawn into a point, and it is apparently a little solider than *burtoni*. By an error *Grandidieria anceyi* was allowed to stand as a separate species in the Synopsis. I do not know whether it or *G. smithi* has precedence, both having been published the same year, but I believe that they are the same.

GRANDIDIERIA GRAVIDA Bourguignat.

Shell short, irregularly oval, subsolid, inflated, inequilateral; beaks rather high and pointed, turned forward, with zigzag-radial sculpture; anterior end rounded, subangulate above; base very full, especially behind the middle, but incurved in front of the posterior point; posterior ridge narrowly double, ending behind just below the median line in a narrowly biangulate snout or beak; surface with zigzag-radial and well-marked concentric sculpture; pseudocardinals somewhat elongated, compressed, reflexed and cut into strongly marked teeth; laterals rather ragged; nacre whitish or purplish.

Length 33, height 26, diam. 20 mm.

Lake Tanganyika.

Grandidieria gravida BOURGUIGNAT, Bull. Soc. Mal. Fr., II, 1885, p. 7, pl. 1, figs. 1-6; Icon. Moll. Tan., 1888, p. 41, pl. XVIII, figs. 11-16.—SIMPSON, Syn., 1900, p. 829.

Grandidieria rostrata BOURGUIGNAT, Bull. Soc. Mal. Fr., II, 1885, p. 10, pl. 1, figs. 10-12; Icon. Moll. Tan., 1888, p. 41, pl. XVIII, figs. 17-19.

Unio rostralis VON MARTENS, Besch. Deuts. Ost-Af., 1897, p. 238.

Grandidieria locardiana BOURGUIGNAT, Esp. Ouk., 1885, p. 18. —SIMPSON, Syn., 1900, p. 830.—GERMAIN, Moll. Lac Tang., 1908, p. 682, figs. 31-32.

Shorter in proportion to length than *G. tanganyicensis* and having more compressed, reflexed pseudocardinals. These, as figured by Bourguignat, are remarkable and resemble to some extent those of *Lampsilis parva* of the United States.

GRANDIDIERIA ROTHSCHILDI Neuville and Anthony.

"Shell subrotund, slightly longer than high, rounded in front, slightly carinated and scarcely pointed posteriorly; concentrically striate along the margin, above, at the umbones, in the centre of the disk and on the posterior slope strongly plicate; cardinal teeth usually small; anterior lamella thick and plicate; posterior oblong.

Length 27, height 20 mm." (N. & A.).

Type locality, Lake Rodolphe.

Unio (Grandidieria) rothschildi NEUVILLE and ANTHONY, Bull. Mus. Hist. Nat., 1906, p. 409; Bull. Soc. Philom., (9), VIII, 1906, p. 409, pl. 12.

"This species, which is distinguished by its very strong, bilateral inflation, belongs to the group of Unios from Tanganyika that Bourguignat, relying on characters of very little value, incorrectly thought should be referred to the family *Sphæriidæ* and for which he established the genus *Grandidieria.* It is related, moreover, to certain types of Unios from Lake Victoria, such as *Unio acuminatus* Adams and *U. grandidieri* Bgt. It is, however, more closely allied to *Unio (Pareyssia) bakeri* Adams or to *Unio (Grandidieria) gravida* Bgt. Much resembling the former by its general form, it is distinguished by its shorter contour and the more marked accentuation of the folds, which extend more generally over the surface than in that species. It differs from the second (*U. gravida* Bgt.) by being more pointed posteriorly, less height compared with the length and stronger plications."

GRANDIDIERIA THOMSONI (Smith).

Shell small, irregularly ovate, subinflated, inequilateral; beaks only moderately full or high, zigzag-wrinkled, rather pointed; anterior end narrowed and rounded; base quite full at or just behind the middle; from there to the posterior point the outline is straight; posterior ridge close to the dorsal outline, narrowly rounded, lightly curved, ending in a decided point on the median line; surface more or less covered with fine, corrugated sculpture; epidermis yellowish or pinkish, faintly rayed with a dull pinkish hue; anterior teeth small, irregularly cut into denticles; nacre variable, bluish-white rayed with pinkish, or uniform purplish.

Length 21, height 15, diam. 10 mm.

Lake Tanganyika.

Unio thomsoni SMITH, Ann. and Mag., VI, 1880, p. 430; Proc. Zool. Soc. Lond., 1881, p. 299, pl. XXXIV, fig. 36.

Grandidieria thomsoni BOURGUIGNAT, Bull. Soc. Mal. Fr., II, 1885, p. 7.—SIMPSON, Syn., 1900, p. 829.

Grandidieria corbicula BOURGUIGNAT, Not. Prod., 1885, p. 100; Icon. Moll. Tan., 1888, p. 43, pl. XIX, figs. 10-12.

Grandidieria granulosa BOURGUIGNAT, Not. Prod., 1885, p. 102; Icon. Moll. Tan., 1888, p. 43, pl. XIX, figs. 1, 2.

Grandidieria singularis BOURGUIGNAT, Icon. Moll. Tan., 1888, p. 43, pl. XIX, figs. 18-20.

Close to *tanganyicensis* and I fear that it is only a mutation of that variable species. The curved post-dorsal outline and the straight outline of the hinder part of the base cause the hinder point of the shell to appear as if it drooped, and this peculiar configuration is different from that of *tanganyicensis*.

GRANDIDIERIA RHYNCHONELLA Bourguignat.

Shell somewhat elongated, irregularly ovate, inflated, rather solid; beaks full and high; anterior ends rounded; base line full and curved, a little fuller just behind the middle; posterior ridge double, ending in a long, biangulate beak on the median line; surface with light, concentric sculpture, scarcely corrugated.

Length 24, height 12 mm.

Lake Tanganyika.

Grandidieria rhynchonella BOURGUIGNAT, Icon. Moll. Tan., 1888, p. 43, pl. XIX, figs. 16, 17.—SIMPSON, Syn., 1900, p. 829.

A decidedly elongate form with very full, high beaks, having the posterior end drawn out into a long beak or rostrum.

GRANDIDIERIA CALLISTA Bourguignat.

Shell somewhat elongated, irregularly ovate, scarcely inflated, slightly inequilateral; beaks very full and high; posterior ridge strong, double, ending at or below the median line in a slight biangulation; the anterior and posterior ends both drawn out and much narrower than the middle of the shell; anterior end rounded, subangular above and below; posterior end slighty angled above and below; the base line is very full and rounded just behind the middle; surface covered with zigzag-radial and subnodulous sculpture.

Length 22, height 14, diam. 9 mm.

Lake Tanganyika.

Grandidieria callista BOURGUIGNAT, Icon. Moll. Tan., 1888, p. 43, pl. XIX, figs. 13-15.—SIMPSON, Syn., 1900, p. 829.

A most singularly shaped shell, being high and full in the middle and drawn out into a sort of beak at each end. It is quite probable that the specimens figured are somewhat distorted *G. rhynchonella*, though that species is apparently much smoother. Unfortunately I do not have access to any original material of this and two other species of this group, which are figured in Bourguignat's Iconographie.

GRANDIDIERIA GIRAUDI Bourguignat.

Shell decidedly and irregularly long rhomboid, scarcely inflated, inequilateral; beaks sharp, subcompressed and but little elevated; anterior end broadly rounded, subangulate above; base line full below and just in front of the beaks, greatly incurved towards the posterior end; posterior ridge double, rather wide, much curved, close to and parallel with the dorsal outline, ending at the base of the shell in a long, drawn out, biangulate beak, which curves downward in a remarkable manner; surface curved with fine, zigzag-radial, subgranulous sculpture.

Length 28, height 18, diam. 11.5 mm.

Lake Tanganyika.

Grandidieria giraudi BOURGUIGNAT, Nat. Prod., 1885, p. 95.—SIMPSON, Syn., 1900, p. 830.—GERMAIN, Moll. Soc. Tang., 1908, p. 683, figs. 33-34.

Grandidieria bourguignati JOUBERT in Bourguignat, Icon. Moll. Tan., 1888, p. 43, pl. XIX, figs. 7-9.—SIMPSON, Syn., 1900, p. 829.—GERMAIN, Moll. Lac. Tang., 1908, p. 683, figs. 35-36.

A remarkably formed shell, having a long, biangulate posterior beak that curves downward in a striking manner. I cannot feel sure as to the validity of several of these species, as I have seen but a small amount of material belonging to only a few of them. I cannot help suspicioning that in some cases distorted or unhealthy shells have been selected and made the types of so-called species.

Germain (l. c.), considers *bourguignati* as synonym of *giraudi*. He, however, also refers the form to *gravida* as "a var. *elongata* of the *rostrata* type."

GRANDIDIERIA TSADIANUS von Martens.

"Shell solid, oblong-elliptical, much inflated, concentrically striate and marked with more distinct lines of growth; yellowish or greenish-brown; shortly rounded in front; subrostrate behind; dorsal margin sloping in front, horizontal and straight to the end of the laterals, thence oblique at an obtuse angle; ventral margin strongly curved at both ends; beaks swollen, incurved, eroded, sculptured with a few, scattered nodules and posteriorly with a few, short, compressed folds straight or slightly converging. Nacre bluish, somewhat shining, slightly radiate striate. Pseudocardinals in the right valve two, compressed, separated by a deep, longitudinal groove, the upper thin and longer, the lower a little thicker, shorter, less prominent; in the left valve one, compressed, slightly concave above, prominent and elongated, and one under the beak, compressed, triangular, obtuse, with two small, auxiliary teeth between them; laterals elongate, slightly curved, in the right valve one, sculptured above with two, light, longitudinal lines; in the left valve two, subequal.

Length 31, greatest height 20, at the umbones 19, diam. 18 mm. Beaks situated at 1-4 of the length." (von Martens).

Type locality, South shore of Lake Tsad.

Unio (Grandidieria) tsadianus VON MARTENS, S. B. Ges. Naturf., 1903, p. 8.

"At the first glance, this species reminds one of the species of Tanganyika, especially *Unio burtoni* Woodw., by reason of the greatly swollen upper portion of the shell, the general outline and the brilliancy of the nacre, but the sculpture is a little weaker, as are also the anterior teeth.

No similar species is known to me from the Nile. One specimen in the Berlin Museum received in about 1841 from Captain Mion from Senegal, resembling *U. gabonensis* Kust., has a certain likeness in size and inflation, but is decidedly nearer *Unio ægypticus* and *niloticus* Fer., (group *Pharaonia* Bgt.), owing to the thin shell, the more central beaks, the very thin cardinal teeth and the less brilliancy of the nacre, than our species from Lake Tsad."

GRANDIDIERIA CHEFNEUXI Neuville and Anthony.

"Shell elongated, much longer than high, rounded before, slightly pointed behind, posterior ridge slightly angulated; concentrically striate in the central part of the disk near the margin and on the dorsal slope, slightly plicate above and at the umbones; cardinal teeth minute; anterior lamella rather thick; posterior elongate.

Length 28, height 18 mm." (Neuville and Anthony).

Type locality, Lake Rodolphe.

Unio (Grandidieria) chefneuxi NEUVILLE and ANTHONY, Bull. Mus. Hist. Nat., 1906, p. 409; Bull. Soc. Philom. (9), VIII, 1906, p. 410, pl. 12.

"This species is specially distinguished by the restriction to the beaks of the characteristic plications and its elongated form. It resembles, perhaps, *Unio acuminatus* Ad."

The following are unfigured species of *Grandidieria*:

G. rotundata Bourguignat, Not. Prod., 1885, p. 98.

G. mira Bourguignat, Not. Prod., 1885, p. 96.

G. incarnata Bourguignat, Moll. Gir., 1885, p. 101.

G. elongata Bourguignat, Moll. Gir., 1885, p. 14.

Genus PHYSUNIO, Simpson, 1900.

Physunio Simpson, Syn., 1900, p. 830.

Shell thin, irregularly obovate, narrowed in front, decidedly produced at post-base, pointed behind and posteriorly winged, with a moderate posterior ridge and often a second or third faint ridge above it; beak sculpture zigzag-radial, somewhat disposed in two sets, the one down the posterior ridge slightly nodulous; posterior slope having irregular, radial corrugations, the rest of the shell smooth; epidermis often cloth-like, with one or more green rays on the posterior slope; hinge line curved; a single obliquely granularly striate pseudocardinal and generally three laterals in the left valve and two pseudocardinals and two laterals in the right, all greatly compressed; beak cavities deep; muscle scars irregular; nacre bright, bluish, and iridescent.

Animal unknown.

Type, *Unio gravidus* Lea.

At first sight the members of this group would seem to be closely related to if not identical in some cases with *Hyriopsis*, but so far as is known the beak sculpture is very different from that of members of that group, being decidedly zigzag-radial, while that of *Hyriopsis* is concentric. The inflated forms like *gravidus* and *superbus* appear to be connected with the group *Lens* through such species as *semialatus* and *micropterus*.

Key to species of Physunio.

Shell much inflated.	
Light greenish or greenish-yellow.	*gravidus.*
Dark brownish.	*superbus.*
Moderately inflated.	
Decidedly inflated.	*micropterus.*
Obovate.	
Shell rather large, 80 mm.	*semialatus.*
Shell rather small, 35 mm.	*crossei.*
Small, 25 mm., bronzy.	*cambodiensis.*
Shell compressed, strongly winged.	
Painted green and yellow.	*eximius.*
Uniform yellowish-green.	*friersoni.*

Section PHYSUNIO s. s.

Shell inflated; beak cavities deep and rounded.

PHYSUNIO GRAVIDUS (Lea).

Shell irregularly obovate, inflated, thin inequilateral; beaks full and high, the sculpture apparently almost radial, with two radiating ridges, the hinder one bearing pustules; posterior ridge often scarcely marked, but faintly angulate, and ending in a slight angle below the median line; sometimes there are one or two feeble, dark ridges on the dorsal slope; hinge line slightly sinuous, running up into a low wing, behind which it is almost squarely truncated posteriorly; anterior end narrowed and rounded; base line almost angularly inflated behind the middle; surface with fine, radial or chevron-shaped wrinkles on the dorsal slope; epidermis ashy-yellowish, green-tinted, sometimes having faint, dark ashy rays, smooth, dull or shining; left valve with one elongated, compressed, ragged pseudocardinal and two remote, curved laterals; right valve with two compressed pseudocardinals, the upper small and one lateral; muscle scars shallow; nacre brilliant, bluish, silvery and iridescent.

Length 101, height 81, diam. 60 mm.

Siam; Cambodia; Cochin China.

Unio gravidus LEA, Pr. Ac. N. Sci. Phila., VIII, 1856, p. 93; Obs., VI, 1857, p. 12, pl. XXIV, fig. 5; Jl. Ac. N. Sci. Phila., III, 1858, p. 292, pl. XXIV, fig. 5.—SOWERBY, Conch. Icon., XVI, 1866, pl. LII, fig. 271.

Margaron (Unio) gravidus LEA, Syn., 1870, p. 28.

Lampsilis gravidus ROCHEBRUNE, Bull. Soc., Phil., VI, 1882, p. 43.

Physunio gravidus SIMPSON, Syn., 1900, p. 830.—HAAS, Conch. Cab., Unio, 1912, pl. 35, fig. 1.

Unio abnormis MORELET, Rev. et Mag., XIV, 1862, p. 480.

Unio superbus SOWERBY, Conch. Icon., XVI, 1867, p. LIX, fig. 295.

A magnificent shell of delicate structure and large proportions, the nacre being of a remarkable shade of blue, silvery and almost as rich as that of a *Nautilus*. The greatest diameter is just behind the beaks; from this point there is a sudden and regular decrease in diameter to either end. The species is closely allied to *P. superbus* but is not quite so solid, is less inflated, is lighter colored and has a more brilliant nacre.

PHYSUNIO SUPERBUS (Lea).

Shell large, irregularly obovate, somewhat inflated, inequilateral, scarcely subsolid; beaks full and high, their sculpture apparently zigzag-radial, and having a row of tubercles on their posterior ridge; hinge line lightly curved, with a small wing behind; anterior end narrowed and rounded, angled above; base line almost straight but very full behind the middle; posterior end almost squarely subtruncate; posterior ridge moderate, lightly angled, ending in a rounded point below the median line; surface with irregular, concentric growth lines; epidermis smoky-brown or smoky-olive, scarcely shining; pseudocardinals elongated, ragged, one in the left valve and two in the right; laterals remote, curved, two in the left valve and one in the right; muscle scars shallow; nacre bluish-white, smoky-tinted, iridescent behind.

Length 93, height 75, diam. 44 mm.

Sumatra; Cochin China.

Unio superbus LEA, Desc. 12 New Uniones, 1843 (no pagination); Tr. Am. Phil. Soc., IX, 1845, p. 281, pl. XLII, fig. 11; Obs., IV, 1848, p. 39, pl. XLII, fig. 11.

Margaron (Unio) superbus LEA, Syn., 1852, p. 19; 1870, p. 28.

Physunio superbus SIMPSON, Syn., 1900, p. 830. — HAAS, Conch. Cab., Unio, 1912, pl. 35, fig. 2.

Unio velaris HANLEY, Biv. Shells, 1856, p. 385, pl. XXIII, fig. 42.

Unio massini MORELET, Jl. de Conch., XII, 1864, p. 288; Ser. Conch., IV, 1875, p. 348, pl. XV, figs. 1, 3.

A fine species, close to *gravidus* but solider, having a darker epidermis, less inflated, with a curved hinge line instead of a sinuous one, and with smoky-bluish nacre, not nearly so brilliant as that of *gravidus*. There are one or two darker rays on the posterior slope.

PHYSUNIO CROSSEI (Deshayes and Julien).

Shell irregularly obovate, thin, inequilateral, scarcely inflated; beaks moderately full, acute, sculptured with rather regular, subradial ridges, which unite along a median line to form a chevron-shaped pattern; anterior end rounded, narrowed, angled above; base line straight, very full behind the middle; hinge line a little sinuous, the hinder end produced into a small wing; posterior end obliquely truncate above, biangulate on the median line; surface delicately, concentrically sculptured; dorsal slope with subradial plications; epidermis fuscous-yellowish; teeth delicate, much compressed; nacre flesh-colored, iridescent.

Length 35, height 22, diam. 13 mm.

Cambodia; Cochin China.

Unio crossei DESHAYES and JULIEN, N. Arch. Mus., X, 1874, p. 124, pl. VI, figs. 5-7.

Physunio crossei SIMPSON, Syn., 1900, p. 831.

Contradens crossei HAAS, Conch. Cab., Unio, 1912, pl. 20, figs. 1-3.

If the specimen described and figured by Deshayes is adult the species is much smaller and much less inflated than either *gravidus* or *superbus*. The beak sculpture is figured and consists of beautifully regular, subradial bars, which meet on a median line and form a sharply pointed chevron-shaped pattern.

PHYSUNIO MICROPTERUS (Morelet).

Shell subrhomboid, subinflated, inequilateral, rather thin; beaks full and high; anterior end narrowed and rounded, scarcely angulate above; base line lightly curved, slightly fuller behind the middle; dorsal outline curved, carried up behind into a small wing; dorsal slope obliquely subtruncate behind; posterior ridge full, rounded, ending in a rounded point near the base of the shell; surface with very fine, concentric sculpture and a few wrinkles; epidermis greenish-olive, subshining;

pseudocardinals and laterals compressed, lamellar, lightly curved; muscle scars shallow; nacre pale bluish, iridescent.

Length 60-68, height 37-41, diam. 23-25 mm.

Siam; Cambodia.

Unio micropterus MORELET, Jl. de Conch., XIV, 1866, p. 63; Ser. Conch., IV, 1875, p. 349, pl. XV, fig. 6.

Physunio micropterus SIMPSON, Syn., 1900, p. 831.—HAAS, Conch Cab., Unio, 1912, pl. 33, fig. 9.

I cannot be certain as to the relationships of this species as I know nothing whatever of the beak sculpture, and the form is more distinctly rhomboid than in any of the species I have placed in the group.

PHYSUNIO SEMIALATUS (Deshayes and Julien).

Shell irregularly obovate, thin, scarcely inflated, inequilateral; beaks full, and somewhat elevated, their sculpture not known; posterior ridge rounded, nearly straight, ending behind in a rounded point about on the median line; hinge line straight, carried out into a small wing behind; anterior end narrowed, rounded, angled above; base line lightly curved, very full and widely rounded behind the middle; dorsal slope obliquely truncate behind; surface with delicate growth lines with a slight radial ridge on the posterior slope and a row of minute wrinkles or folds along it with a few feeble plications above it; epidermis greenish-olive, brilliant; teeth greatly compressed, lamellar; laterals curved, apparently triple in the left valve; nacre yellowish, brilliant.

Length 83, height 53, diam. 24 mm.

Siam; Cambodia.

Unio semialatus DESHAYES and JULIEN, N. Arch. Mus., X, 1874, p. 123, pl. VI, figs. 1, 2.

Physunio semialatus SIMPSON, Syn.,. 1900, p. 831.—HAAS, Conch. Cab., Unio, 1912, pl. 34, figs. 1-2.

This may be a *Hyriopsis*, but without knowing anything of the beaks I cannot tell. Deshayes says it seems to be equally related to *Unio discoideus* Lea and *U. superbus*.. The row of minute folds down the dorsal slope recalls a character of *Cristaria plicata* and *Hyriopsis cumingii*, but they are a great deal finer than in either of those species.

PHYSUNIO CAMBODIENSIS (Lea).

Shell small, scarcely subsolid, irregularly obovate, subinflated; beaks full and high, somewhat eroded in the only specimen seen but having zigzag-radial sculpture; posterior ridge double, ending in a feeble biangulation below the median line; anterior end narrowed and rounded, slightly angled above; base line lightly curved, full behind the middle; hinge line curved a little, carried out into a small wing behind; dorsal slope obliquely truncate; surface with irregular growth lines, somewhat wrinkled on the dorsal slope; epidermis bronzy-reddish, shining; teeth compressed; laterals curved; muscle scars shallow; nacre bluish-white, iridescent.

Length 25, height 15, diam. 11.5 mm.

Takrong River at Korat, Cambodia.

Unio cambodiensis LEA, Pr. Ac. N. Sci. Phila., VIII, 1856, p. 103; Jl. Acad. N. Sci. Phil., III, 1857, p. 313, pl. XXX, fig. 28; Obs., VI, 1857, p. 33, pl. XXX, fig. 28.

Margaron (Unio) cambodiensis LEA, Syn., 1870, p. 42.

Physunio cambodiensis SIMPSON, Syn., 1900, p. 831.—HAAS, Conch. Cab., Unio, 1912, pl. 34, fig. 5.

I am not at all sure that the type, the only shell of this species I have seen, is adult. It is, however, somewhat strong, and the epidermis is of a peculiar bronzy-reddish tint.

Section LENS Simpson, 1900.

Lens SIMPSON, Syn., 1900, p. 831.

Shell sublenticular; three laterals of left valve distinct; cavity of the beaks compressed.

Type, *Unio eximius* Lea.

PHYSUNIO EXIMIUS (Lea).

Shell subtriangular, compressed, winged on the post-dorsal border, rather thin, inequilateral; anterior end much narrowed, rounded, slightly angled above; base line straight or a little incurved, full behind the middle; dorsal outline lightly curved; dorsal slope almost squarely truncate behind, the line of truncation sometimes a little incurved; beaks neither full or high, their sculpture consisting of corrugated, zigzag-radial bars; posterior ridge low, ending below the median line on adult shells, in a feeble point; surface with fine, concentric growth lines, plicately sculptured on the dorsal slope; epidermis greenish-yellow, marked with imperfect bands and rays of blue-green, subshining; nacre bluish, somewhat iridescent; teeth delicate, lamellar, laterals two in the right valve and three in the left.

Length 65, height to point of wing 50, diam. 17 mm.

Siam; Cambodia.

Unio eximius LEA, Pr. Ac. N. Sci Phila., VII, 1856, p. 93; Obs., VI, 1857, p. 14, pl. XXV, fig. 8; Jl. Ac. N. Sci. Phila., III, 1858, p. 294, pl. XXV, fig. 8.—SOWERBY, Conch. Icon., XVI, 1868, pl. LXXXIX, fig. 481.

Margaron (Unio) eximius LEA, Syn., 1870, p. 28.

Physunio eximius SIMPSON, Syn., 1900, p. 831.—HAAS, Conch. Cab., Unio, 1912, pl. 34, figs. 6-8.

Unio semiquadrata SOWERBY, Conch. Icon., XVI, 1866, pl. XLVIII, fig. 258.

Unio semiquadratus PÆTEL, Conch. Sam., III, 1890, p. 167.

The old shells of this species are decidedly triangular, having a high post-dorsal wing, and have almost exactly the appearance of a *Hyriopsis*. But the younger shells are rather more inflated in proportion and show relationships to *P. gravidus* and *superbus*. Their beak sculpture is decidedly zigzag-radial and not concentric as it is, in all cases where I have been able to examine it, in *Hyriopsis*.

PHYSUNIO FRIERSONI n. n.

Shell obovate or subtriangular, thin, rather compressed, pale green, neither radiated or sculptured; beaks small, pointed; posterior ridge scarcely developed; anterior end much narrowed, rounded, angled above; base line nearly straight, full near the posterior end; dorsal line with a high posterior wing, which is almost squarely truncate behind; posterior end widely and evenly rounded; lunule excavated; pseudocardinals large, lamellar.

Assam.

Unio velaris SOWERBY, Conch. Icon., XVI, 1868, pl. LXXII, fig. 368.

Physunio velaris SIMPSON, Syn., 1900, p. 831.—HAAS, Conch. Cab., Unio, 1912, pl. 34, fig. 9.

I have never seen this species and as I know nothing regarding its beak sculpture I cannot be certain whether it belongs here or in *Hyriopsis*. Sowerby does not say anything about its nacre. Compared with *P. eximius*, to which it seems most closely related, it is a shorter shell, more rounded behind and lighter colored. I think it likely that the shell figured is young.

Genus SIMPSONELLA Cockerell, 1903.

Dalliella SIMPSON, Syn., 1900, p. 832; *non* Cossman, 1895.

Simpsonella COCKERELL, Naut., XVI, 1903, p. 118.

Shell subtrapezoidal, generally thin, inflated, with a low, rounded posterior ridge and rather full beaks, which have somewhat zigzag-radial sculpture, with a row of chevron-shaped folds running some distance down the posterior ridge, and with fine corrugations in front of the beaks; epidermis somewhat cloth-like; substance of the shell of a peculiar purplish-brown tint; hinge line narrow; teeth imperfectly developed, sometimes reduced to mere rudiments, when present consisting of greatly compressed, feeble pseudocardinals and laterals; beak cavities rather shallow; dorsal scars one to a few, scattered; muscle scars faint; prismatic border wide.

Animal unknown.

So far as conchological characters go, and we know nothing of the anatomy of the above group, it would seem that *Simpsonella* was closely related to *Pseudodon*. In the present genus pseudocardinals and laterals are generally present, though quite commonly in greatly reduced form, they are compressed or lamellar, while in *Pseudodon* the laterals are wanting and the pseudocardinals are smooth and usually more or less tubercular. There is a peculiar purplish or coppery tint present in all the members of this genus. The group of *S. insularis* seems to partially connect it with *Pseudodon*.

Type, *Anodonta purpurea* Valenciennes.

KEY TO SPECIES OF SIMPSONELLA

Shell rather thin, nacre purple or coppery.	
Subrhomboid.	
Short, subshining.	*purpurea.*
Somewhat elongated, silky.	*subcrassa.*
Wide behind. dark.	*tenuis.*
Much elongated.	*gracilis.*
Obovate.	*crepera.*
Shell subsolid, nacre lurid, tinted purplish.	
With feeble concentric sculpture, subshining.	*crassa.*
With strong, concentric sculpture, dull.	*insularis.*

Group of *Simpsonella purpurea.*

Shell not biangulate behind, rather smooth; nacre coppery-purple; teeth very faint, compressed.

SIMPSONELLA PURPUREA (Valenciennes).

Shell subelliptical or subrhomboid, scarcely inflated, rather thin, inequilateral; beaks only moderately full and high, pointed and turned slightly forward, sculptured with zigzag bars; anterior end rounded; base line nearly straight, often a little full behind the middle; dorsal outline lightly curved; dorsal slope obliquely subtruncate; posterior ridge and the lower part of the hinder end rounded; surface with delicate, irregular growth lines; epidermis brownish-coppery, darker and with an indistinct, green ray or two on the dorsal slope; teeth rudimentary, there being delicate, vestigial, lamellar pseudocardinals and laterals; muscle scars shallow; nacre coppery with radial markings; prismatic layer wide, lurid coppery.

Length 57, height 32, diam. 19 mm.
Length 50, height 31, diam. 18 mm.
Length 66, height 38, diam. 25 mm.
Length 54, height 28, diam. 20 mm.
Philippines.

Anodonta purpurea VALENCIENNES, Rec. Obs. Zool., II, 1833, p. 236, pl. XLVIII, bis, fig. 3, 3*a*, 3*b*.—CLESSIN, Conch. Cab. Ano., 1876, p. 77, pl. XIX, fig. 1.

Margarita (Anodonta) purpurea LEA, Syn., 1836, p. 51; 1838, p. 30.

Anodon purpurea CATLOW and REEVE, Conch. Nom., 1845, p. 67.

Margaron (Anodonta) purpurea LEA, Syn., 1852, p. 50; 1870, p. 79.

Dalliella purpurea SIMPSON, Syn., 1900, p. 832.

Simpsonella purpurea HAAS, Conch. Cab., Unio, 1912, pl. 24, figs. 1-3.

Anodonta burroughiana, LEA, Tr. Am. Phil. Soc., V, 1834, p. 105, pl. XVI, fig. 49; Obs., I, 1834, p. 217, pl. XVI, fig. 49.—CLESSIN, Conch. Cab. Ano., 1875, p. 164, pl. LIV, figs. 3, 4.

Margaron (Anodonta) burroughiana LEA, Syn., 1870, p. 81.

Anodon burroughianus, SOWERBY, Conch. Icon., XVII, 1870, pl. XXVII, fig. 103.

Margarita (Unio) bengalensis LEA, Syn., 1836, p. 26; 1838, p. 20.

Unio bengalensis LEA, Tr. Am. Phil. Soc.,VI, 1838, p. 3, pl. II, fig. 3; Obs., II, 1838, p. 3, pl. II, fig. 3.—HANLEY, Biv. Shells, 1843, p. 194, pl. XXI, fig. 50.—CHENU, Ill. Conch., 1858, pl. XXII, figs. 2, 2*a*, 2*b*.--KUSTER, Conch. Cab. Unio, 1861, p. 228, pl. LXXVII, figs. 2, 3.

Margaron (Unio) bengalensis LEA, Syn., 1852, p. 30; 1870, p. 47.

Anodon bengalensis SOWERBY, Conch. Icon., XVII, 1867, pl. XIV, fig. 49.

Anodonta bengalensis CLESSIN, Conch. Cab. Ano., 1876, p. 173, pl. LVII, fig. 1.

Unio verecundus GOULD, Pr. Bost. S. N. Hist., III, 1850, p. 295; U. S. Expl. Exp., XII, 1852, p. 431, figs. 541, 541*a*, 541*b*, 541*c*.—REEVE, Conch. Icon., XVI, 1865, pl. XXV, fig. 125.

Unio mauritianus LEA, Pr. Ac. N. Sci. Phila., III, 1859, p. 152; Jl. Ac. N. Sci. Phila., IV, 1860, p. 257, pl. XL, fig. 138; Obs., VII, 1860, p. 75, pl. XL, fig. 138.

Margaron (Unio) mauritianus LEA, Syn., 1870, p. 42.

?*Anodonta heldii* Kuster, Conch. Cab. Ano., 1873, p. 64, pl. xix, fig. 1.

Anodonta chinensis Kuster? Where?

This seems to be an abundant form and quite a variable one. I have no doubt but that Lea's *Unio bengalensis* is the same as the *Anodonta purpurea* of Valenciennes, as is Lea's *Unio mauritianus* and that the localities, India and Mauritius, given by him are wrong. The shell is usually somewhat long rhomboid, the anterior end being a little narrowed, the dorsal and ventral outlines being nearly parallel. Sometimes, however, the outline is almost evenly elliptical or slightly obovate. Specimens of *Anodonta purpurea*, so labeled by Morelet, and from his collection, belong to the National Museum and do not in any essential character differ from Lea's types of *U. bengalensis* and *mauritianus*. Sometimes the texture of the shell is coppery-tinted with green, and in other cases it is decidedly violet.

Simpsonella crepera (Lea).

Shell somewhat elongated, almost regularly obovate, rather thin, convex, inequilateral; beaks not full or high, their sculpture zigzag-radial; posterior ridge low, rounded, sometimes feebly double and at such time ending in a very slight biangulation behind; surface with irregular growth lines; epidermis dull brownish, banded with greenish and feebly rayed, subshining; teeth reduced to mere lineal vestiges; muscle scars shallow; nacre dull, lurid, coppery-tinted, a little thickened in front, slightly iridescent behind; prismatic layer wide, dull, coppery-tinted.

Length 85, height 43, diam. 27 mm.

Luzon Island, Philippines.

Anodonta crepera Lea, Pr. Zool. Soc. Lond., 1850, p. 198; Jl. Ac. N. Sci. Phila., IV, 1860, p. 238, pl. xxxiv, fig. 117; Obs., VII, 1860, p. 56, pl. xxxiv, fig. 117.—Clessin, Conch. Cab. Ano., 1873, p. 97, pl. xxix, figs. 5, 6.

?*Anodon creperus* Sowerby, Conch. Icon., XVII, pl. viii, fig. 16.

Margaron (Anodonta) crepera LEA, Syn., 1852, p. 50; 1870, p. 80.

Dalliella crepera SIMPSON, Syn., 1900, p. 833.

Simpsonella crepera HAAS, Conch. Cab., Unio, 1912, pl. 25, fig. 1.

The dimensions given above are from the type, which is a larger shell than any specimen I have ever seen of *purpurea*. It is more evenly obovate and more elongate in proportion to height as a rule than that species, and the color is rather more dull. The teeth are, perhaps, more faintly developed.

SIMPSONELLA TENUIS (Lea).

Shell decidedly long rhomboid, narrowed somewhat in front, inequilateral, thin, scarcely inflated; beaks neither full or high but sharp pointed, sculptured with strong, zigzag ridges; posterior ridge quite full, rounded or feebly biangulate, ending below the median line; dorsal line nearly straight; anterior end rounded, subangulate above; base line straight or very slightly incurved in the middle; dorsal slope obliquely truncated; posterior end rounded below; surface with rather strong growth lines, dull greenish-brown, sometimes faintly rayed; teeth linear and almost obsolete; nacre bluish, flesh-colored or purplish, dull, but iridescent behind.

Length 76, height 41, diam. 24 mm.

Luzon Island, Philippines.

Anodonta tenuis LEA, Pr. Zoo. Soc. Lond., 1850, p. 198; Jl. Ac. N. Sci. Phila., IV, 1860, p. 237, pl. XXXIII, fig. 116; Obs., VII, 1860, p. 55, pl. XXXIII, fig. 116.—MUSGRAVE, Phot. Conch. I., 1863, pl. 1, fig. 8.—CLESSIN, Conch. Cab. Ano,. 1863, p. 99, pl. XXX, figs. 3, 4.

Margaron (Anodonta) tenuis LEA, Syn., 1852, p. 53; 1870, p. 83.

Anodon tenuis SOWERBY, Conch. Icon., XVI, 1867, pl. XV, fig. 55.

Dalliella tenuis SIMPSON, Syn., 1900, p. 833.

Simpsonella tenuis HAAS, Conch. Cab., Unio, 1912, pl. 24, figs. 4-5.

Close to *crepera,* but more decidedly rhomboid, the anterior base of some specimens being somewhat cut away. The posterior ridge is quite high, so much so that there is a faint radial depression in front of it, while that of *crepera* is rather low. The point of greatest diameter is situated nearer the posterior end than in *crepera.*

SIMPSONELLA SUBCRASSA (Lea).

Shell subrhomboid, subsolid, slightly inflated, inequilateral; beaks rather full and high, with zigzag-radial sculpture; anterior part of the shell scarcely narrowed; anterior end rounded, cut away a little below; base line straight or incurved; dorsal outline lightly curved; dorsal slope obliquely truncate above; posterior ridge full, feebly angled, ending in a blunt point below the median line; surface with fine, irregular growth lines on the disk, these become stronger at the ends of the shell; epidermis pale greenish-brown with faint rays, often having a grayish, silky surface when not worn; teeth almost wholly wanting, linear; nacre bluish, salmon-tinted or purplish.

Length 75, height 40, diam. 29 mm.

Luzon Island.

Anodonta subcrassa LEA, Pr. Zool. Soc. Lond., 1850, p. 198; Jl. Ac. N. Sci. Phila., IV, 1859, p. 236, pl. XXXIII, fig. 115; Obs., VII, 1860, p. 54, pl. XXXIII, fig. 115.—MUSGRAVE, Phot. Conch., 1863, pl. 1, fig. 3.—CLESSIN, Conch. Cab. Ano., 1873, p. 98, pl. XXXI, figs. 1, 2.

Margaron (Anodonta) subcrassa LEA, Syn., 1852, p. 51; 1870, p. 81.

Anodon subcrassa SOWERBY, Conch. Icon., XVII, 1867, pl. XIII, fig. 42.

Dalliella subcrassa SIMPSON, Syn., 1900, p. 833.

Simpsonella subcrassa HAAS, Conch. Cab., Unio, 1912, pl. 25, fig. 2.

More solid than the allied species and somewhat more inflated. The epidermis in fresh specimens is wholly or partly covered with a peculiar grayish, silky sort of bloom, which wears off to some extent after they are handled.

SIMPSONELLA GRACILIS (Lea).

Shell rather elongated, the dorsal and ventral outlines being nearly parallel, convex or subinflated, inequilateral, scarcely subsolid; beaks only moderately full or elevated, with zigzag-radial sculpture; anterior end rounded and cut away a little below; posterior ridge rounded or feebly double, ending in a slight biangulation at and below the median line; dorsal slope obliquely subtruncate; surface with irregular growth lines; epidermis pale brownish-green and feebly rayed in the younger shells, coppery-brown in old ones, scarcely shining; teeth rudimentary, reduced to mere lines; anterior scars broken up; nacre varying from bluish to purple or coppery, dull and lurid; prismatic layer wide.

Length 85, height 40, diam. 24 mm.

Dingle, Isle of Panay, Philippines.

Anodonta gracilis LEA, Pr. Zool. Soc. Lond., 1850, p. 197; Jl. Ac. N. Sci. Phila., IV, 1860, p. 239, pl. XXXIV, fig. 119; Obs., VII, 1860, p. 57, pl. XXXIV, fig. 119.—CLESSIN, Conch. Cab. Ano., 1873, p. 99, pl. XXIX, figs. 3, 4.

Margaron (Anodonta) gracilis LEA, Syn., 1852, p. 51; 1870, p. 82.

Dalliella gracilis SIMPSON, Syn., 1900, p. 833.

Simpsonella gracilis HAAS, Conch. Cab., Unio, 1912, pl. 25, fig. 3.

Close to the foregoing species. It is more elongated than any of them, has nearly parallel dorsal and ventral outlines, is very slightly rhomboid, and has dull, lurid nacre, scarcely iridescent behind.

SIMPSONELLA SERRADELLI (Drouet).

Shell ovate, inflated, thin, delicately striate with concentric growth lines, shining, olivaceous; dorsal outline slightly ascending behind; ventral outline nearly straight; posterior end obtusely produced into a beak; beaks rather prominent, with zigzag-radial sculpture; teeth elongate, compressed, rudimentary; muscle impressions shallow; nacre violaceous.

Length 62, height 35, diam. 20 mm.

Philippines.

Unio serradelli DROUET, Jl. de Conch., XL, 1892, p. 86.

Dalliella serradelli SIMPSON, Syn., 1900, p. 834.

Evidently a *Simpsonella* and quite probably synonymous with some of the species already described. So far as I know it has never been figured. If the outline is really ovate as is claimed in the description, it may be a valid species.

Group of *Simpsonella insularis*.

Shell subsolid, subrhomboidal, biangulate behind; pseudocardinals and laterals blurred, not greatly compressed; nacre lurid, tinged purplish.

SIMPSONELLA INSULARIS (Drouet).

Shell long rhomboid, inequilateral, slightly narrowed and rounded in front, subcompressed, subsolid; beaks not prominent; dorsal line lightly curved; basal line nearly straight; dorsal slope obliquely truncate; posterior ridge moderate, somewhat double, ending below the median line in a feeble biangulation; surface with strong, sulcate, concentric sculpture; epidermis brown, not shining; vestigial pseudocardinals and laterals present; nacre lurid.

Length 48, height 30, diam. 15 mm.

Borneo; Palawan Island, Philippines.

Pseudodon insularis DROUET, Rev. Biol. Fr., VI, 1894, p. 217, fig. 2.

Dalliella insularis SIMPSON, Syn., 1900, p. 834.

Pressidens insularis HAAS, Nachr. Deutsch. Mal. Ges., 1910, p. 103; Conch. Cab., Unio, 1912, pl. 23, figs. 1-2.

Close to *S. crassa,* but appears to be smaller, not quite so much elongated, more compressed, more strongly, concentrically sculptured and duller-colored. I have seen one young shell and an adult valve of what I take to be this species, from Palawan Island, belonging to the collection of Mr. Berlin H. Wright. These have somewhat zigzag sculpture, perfect laterals and moderately developed pseudocardinals.

According to Haas, (l. c.), this species belongs to his new genus *Pressidens.*

SIMPSONELLA CRASSA (Drouet).

Shell long rhomboid, slightly narrower in front, subsolid, convex or slightly inflated, inequilateral; beaks not prominent, their sculpture apparently zigzag-radial; posterior ridge full, imperfectly double, ending in a wide, feeble biangulation below the median line; dorsal line lightly curved; base line straight or nearly so; anterior end rounded; dorsal slope obliquely truncated; surface with irregular, concentric sculpture; epidermis warm brown, subshining; teeth feeble or rudimentary, lamellar, vestiges of both pseudocardinals and laterals being present; muscle scars shallow; nacre pale purplish, coppery-tinted, slightly thickened in front.

Length 68, height 37, diam. 21 mm.

Borneo.

Pseudodon crassus DROUET, Jl. de Conch., XL, 1892, p. 93.—DROUET and CHAPER, Mem. Soc. Zool. de Fr., V, 1892, p. 151, pl. VI, figs. 1-3.

Dalliella crassa SIMPSON, Syn., 1900, p. 834.

Two fine specimens of this species from Banguey Islands, North Borneo, received under the name *Pseudodon insularis*, are in the National Museum collection. It is a smoother, more inflated, rather more elongate form than *insularis*, though the two are closely related and, I believe, belong here instead of with *Pseudodon*. In the latter group the vestigial pseudocardinals are stumpy and there are no laterals; in *Simpsonella* there are vestigial pseudocardinals and laterals, the whole being lamellar.

Genus PRESSIDENS Haas, 1910.

Pressidens HAAS, Nachr. Deutsch. Mal. Ges., 1910, p. 102.

"Shell oval, thin. Beaks low, beak-cavities shallow; beak sculpture consisting of concentric ridges, each ridge made up of two curves, which meet in a sharp angle on the oldest part of the beak and gently curve with each other on the younger part; the anterior of these curves surrounds the front of the beak in a semi-circle, the posterior curve is angularly bent downwards towards the posterior margin so that the vertex of the angle is on the posterior ridge, the upper part of the rear curve is the most prominent part of the beak sculpture and continues down on the posterior ridge for a considerable distance from the beaks. Dorsal slope high, triangular. Hinge with a long, compressed cardinal tooth and a long, low lateral in each valve. The cardinal tooth of the right valve and the lateral of the left valve, may have a weak, lamelliform auxiliary tooth above them. Nacre bluish-white, under the beaks salmon-colored.

To this group belong: *P. moellendorffi* n. sp., from Palawan and *P. insularis* Drouet from Palawan and Borneo." (Haas).

Type, *Pressidens moellendorffi* Haas.

PRESSIDENS MOELLENDORFFI Haas.

"Shell oval, thin, finely and evenly striate. Beaks low, with the sculpture given for the genus, almost wholly eroded in mature specimens, situated at 24/100 of the total length. Upper anterior margin straight, slightly sloping, with a distinct angle where it passes into the semicircular anterior end, which curves gradually into the horizontal ventral margin; posterior end obliquely angled; posterior margin oblique, postero-dorsal angle not strong; dorsal margin almost horizontal, which is nearly as high as the beaks. Posterior slope high; posterior ridge low; ligament long, thin. Hinge weak, one lamelliform cardinal tooth and a slightly curved lateral in each valve; in front of the cardinal of the right valve there may be a weak, lamelliform auxiliary tooth and above the lateral of the left valve there are noticable indications of another tooth. Angle of the cardinal teeth 25°, of the lateral teeth 0°. Muscular impressions faint. Nacre bluish-white, under the beaks salmon-colored. Epidermis chestnut-brown, in young shells light yellowish-brown and also on the worn beaks.

Length 63, height 38, diam. 20 mm." (Haas).

Type locality, Paragua, Palawan.

Pressidens moellendorffi HAAS, Nachr. Deutsch. Mal. Ges., 1910, p. 103; Conch. Cab., Unio, 1912, pl. 23, figs. 3-5.

Genus PSEUDODON Gould, 1844.

Pseudodon Gould, Pr. Bost. Soc. Nat. His., 1844, p. 161.
Monodontina Conrad, Pr. Ac. N. Sci. Phila., 1853, p. 269.
Trigonodon Conrad, Am. Jl. Conch., I, 1865, p. 233.
Monocondylus Morelet, Rev. et Mag., 1866, p. 167.
Pseudodus de Morgan, Bull. Soc. Zool. Fr., X, 1885, p. 422.

Shell oval to elongate, having two posterior ridges and often one or two slight, radiating elevations above on the posterior slope, above which there is usually a small wing; beaks rather low, sculpture unknown; epidermis dark, often having a few faint wrinkles on the posterior slope, without rays when adult. There is a single, smooth tooth in each valve, with occasional vestiges of a second; laterals nearly or quite wanting; beak cavities shallow; dorsal scars conspicuous, deep, distinct, 4 to 7 in a row under the hinge; anterior scars irregular; nacre generally dull and lurid.

Animal having the branchiæ wide and rounded behind, becoming narrow in front; palpi enormously long, apparently slender, pointed behind, where they project free for some distance; mantle thin, with a wide, slightly thickened border, faintly papillose behind, there seeming to be but little distinction between anal and branchial openings; anal opening apparently smooth.

Type, *Anodon inoscularis* Gould.

The genus *Pseudodon* of Gould, as I have defined it, contains a limited number of species of Unionidæ belonging exclusively to the Oriental Region. The shells vary a good deal in form, from nearly orbicular to considerably elongated; they are generally brownish or blackish and without rays, and without striking sculpture. They have usually but a single blunt tooth in each valve, which is almost always smooth. In two or three species there is a vestigial second tooth. The laterals are nearly or quite wanting; when present they are represented merely by a low, longitudinal ridge. The ligamental patch is mostly rather conspicuous and there is in a number of the forms, a slight indication of a pallial sinus.

All that is known of the animal is the figure, without description, of Deshayes and Jullien of *P. moreleti.* From the character of the shells I am inclined to believe that they are closely related to those of *Simpsonella*, though I have been unable to examine any specimens that gave any clue to the beak sculpture. I am not certain that all the species I have placed in *Pseudodon* should go there.

KEY TO SPECIES OF PSEUDODON.

- Shell somewhat elongated.
  - Inflated.
    - Rather thin. *nankingensis.*
    - Subsolid. *secundus.*
  - Not inflated.
    - Blackish, folded on dorsal slope. *loomisi*
    - Brownish. *salwenianus.*
      - Green-tinted, scarcely convex. *mouhoti.*
      - Tawny, convex. *exilis.*
      - Compressed. *solidus.*
- Shell not elongated.
  - Triangular or subtriangular. *cambodjensis.*
  - Subrhomboid.
    - Strongly, concentrically sulcate.
      - Inflated. *chaperi.*
      - Convex or subcompressed. *crebristriatus.*
    - With folds on the dorsal slope. *harmandi.*
    - Nearly smooth or merely concentrically striate.
      - Shell inflated; dorsal ridge high. *aureus, walpolei.*
    - Compressed or merely convex. *resupinatus, æneolus, cumingii, vondembuschianus, zollingeri, ovalis.*
    - Subinflated. *inoscularis, peguensis.*
    - Inflated, large. *moreleti, ponderosus.*
  - Obovate, subinflated. *bicristatus, thomsoni.*
  - Oval.
    - Inflated. *tumidus.*
    - Subcompressed or convex. *ellipticus.*
  - Suborbicular. *orbicularis.*

Section SUBORBICULUS Simpson, 1900.

Suborbiculus SIMPSON, Syn., 1900, p. 835.

Shell compressed, nearly round in outline, feebly biangulate, and having a posterior dorsal wing; beaks low; hinge with a single, compressed, smooth, slightly curved, triangular tooth in each valve.

Type, *Monocondylus orbicularis* Morelet.

PSEUDODON ORBICULARIS (Morelet).

Shell suborbicular, compressed, thin, inequilateral; beaks small, acute, compressed, having in front of them a well-marked, deep lunule; dorsal outline behind the beaks decidedly curved and rising to a wing; behind this the dorsal slope is subtruncate; anterior end somewhat narrowed, rounded, angled above at its junction with the lunule; base line well curved; posterior ridge somewhat double and feebly biangulate behind, the longer point of the biangulation being below the median line; surface with light, concentric sculpture, which is more strongly developed at the border; epidermis brownish, subshining; each valve has a single, compressed, elevated and triangular, smooth tooth; nacre bluish, pale salmon in the cavities, iridescent.

Length 74, height 60, diam. 22 mm.

Siam; Cambodia.

Monocondylus orbicularis MORELET, Rev. et Mag., XVIII, 1866, p. 167.

Pseudodon orbicularis MORELET, Ser. Conch., IV, 1875, p. 338, pl. XVI, fig. 5.—SIMPSON, Syn., 1900, p. 835.

Monocondylæa orbicularis PÆTEL, Conch. Sam., III, p. 174.

Evidently a fine species. The outline is suborbicular, the length being slightly greater than the height. There is a deep lunule, which cuts into the outline of the shell and below it the anterior end is strongly angled. The species cannot be mistaken for any other.

Section TRIGONODON Conrad, 1865.

Trigonodon CONRAD, Am. Jl. Conch., I, 1865, p. 233.

Shell solid, compressed rhomboid, round in front, widely and faintly biangulate and rough behind; surface irregularly, concentrically, wavy sulcate; hinge with a strong triangular pseudocardinal in the right valve, having a decided excavation behind it, and at the posterior side of the pit a faint tooth; there is one strong triangular tooth in the left valve and a vestige of one in front of it at the upper edge of the shell; anterior scars irregular; dorsal scars crowded close to the hinge line.

Type, *Monocondylæa crebristriata* Anthony.

PSEUDODON CREBRISTRIATUS (Anthony).

Shell subrhomboid, rather solid, convex, inequilateral; beaks apparently but slightly prominent; posterior ridge inclined to be double, ending in a wide, feeble biangulation near the base of the shell; dorsal and basal outlines slightly curved; anterior end a trifle narrowed, rounded; dorsal slope obliquely truncated; surface with rather fine, irregular, concentric sculpture and light radial sculpture on the dorsal slope; epidermis brownish or yellowish-brown, rather dull; left valve with a strong, triangular tooth, a triangular pit in front of it and a feeble anterior tooth; right valve with a strong, triangular anterior tooth, a triangular pit behind it and a feeble posterior tooth; muscle scars well marked; nacre dull, lurid, bluish, with a flesh-colored tint in the cavities.

Length 60, height 38, diam. 22 mm.

Burma; Pegu; Cambodia?

Monocondylæa crebristriata ANTHONY, Am. Jl. Conch., I, 1865, p. 205, pl. XVIII, fig. 1.

Trigonodon crebristriata CONRAD, Am. Jl. Conch., I, 1865, p. 233.

Margaron (Monocondylæa) crebristriata LEA, Syn., 1870, p. 72.

Unio crebristriatus SOWERBY, Conch. Icon., XVI, 1868, pl. XCV, fig. 517.

Trigonodon crebristriatum HANLEY and THEOBALD, Conch. Ind., 1876, p. 5, pl. IX, fig. 3.

Pseudodon crebristriatus SIMPSON, Syn., 1900, p. 835.

Unio vondembuschii SOWERBY, Conch. Icon., XVI, 1868, pl. XCV, fig. 518.

From a study of material of what I believed was *P. peguensis* and *crebristriatus* in the National Museum I came to the conclusion that both were of the same species. Further study inclines me to doubt whether the *P. peguensis* is genuine. The *crebristriatus* seems to be a smaller, more compressed form, more strongly sculptured, and having less inflated beaks than *P. peguensis*.

Var. *curvatus* Preston.

"Shell having the ventral margin more curved and generally less ovate in shape than in the typical form." (Preston).

Type locality, Pegu.

Pseudodon crebristriatus var. *curvata* PRESTON, Rec. Ind. Mus., VII, 1912, p. 295.

PSEUDODON PEGUENSIS (Anthony).

Shell smooth except on the posterior slope, which has broad, rugose folds, subrhomboid, somewhat narrower in front, inequilateral, subinflated, solid; beaks full and high, the umbonal region broad; posterior ridge more or less double, ending in a wide, feeble biangulation; base line curved, a little fuller behind the middle; anterior end rounded; dorsal slope obliquely subtruncate; epidermis dark brown or nearly black; pseudocardinals prominent and slightly bilobed, particularly in the right valve; anterior scars distinct, deep; posterior scars confluent; dorsal scars deep; nacre light salmon, iridescent.

Length 93, height 60, diam. 30 mm.

Burma; Pegu.

Monocondylæa peguensis ANTHONY, Am. Jl. Conch., I, 1865, p. 205, pl. XVIII, fig. 2.

Margaron (Monocondylæa) peguensis LEA, Syn., 1870, p. 73.

Trigonodon crebristriatum var. *peguensis* HANLEY and THEOBALD, Conch. Ind., 1876, p. 5, pl. IX, fig. 5.

Pseudodon crebristriatus var. *peguensis* SIMPSON, Syn., 1900, p. 835.

Specimens in the National Museum from Pegu labeled *Pseudodon peguensis* are probably *P. crebristriatus*, but they show much variation and approach *peguensis* very closely. Some of them are much larger than Anthony's measurements, as well as more inflated. The chief distinguishing character, I take it, would be the full, high beaks of the latter, while those of *crebristriatus* are not so large or high.

Section PSEUDODON s. s.

Characters given under generic name.

Group of *Pseudodon harmandi.*

Shell rather small, solid, rhomboid, short, inflated; posterior ridge high, only slightly biangulate, faintly corrugated on the posterior slope.

PSEUDODON HARMANDI Crosse and Fischer.

Shell long rhomboid, inflated, solid, inequilateral; beaks apparently somewhat elevated but not inflated; anterior end rounded; base nearly straight; dorsal and post-dorsal outlines curved, being almost subangular behind the ligament; posterior ridge somewhat double, ending in a biangulation at and above the base of the shell; surface for the most part smooth, having some irregular growth lines on the disk and a few, subradial corrugations on the dorsal slope; epidermis dark brown or blackish, shining; in each valve there is a subcompressed smooth tooth; muscle scars well impressed; dorsal scars few, deep, arranged in a row under the beaks; nacre lurid purplish.

Length 62, height 40, diam. 29 mm.

Cambodia.

Pseudodon harmandi CROSSE and FISCHER, Jl. de Conch., XXIV, 1876, p. 331, pl. x, fig. 2.—SIMPSON, Syn., 1900, p. 836.

Monocondylæa harmandi PÆTEL, Conch. Sam., III, 1890, p. 174.

A solid, rhomboid, much inflated species with shining, almost black epidermis. The posterior ridge is rather high, and behind it the dorsal slope falls away abruptly.

PSEUDODON AUREUS Heude.

Shell rather small, subsolid, rhomboid, inflated, inequilateral; beaks somewhat elevated but not inflated, strongly undulate; anterior end rounded; base full at the middle; post-dorsal outline subangulate behind the ligament, below the angulation obliquely truncate; posterior ridge elevated, apparently somewhat double, ending near the base of the shell in a blunt point; epidermis yellowish-green; nacre fuscous-salmon.

Length 30, height 20, diam. 15 mm.

China.

Pseudodon aureus HEUDE, Conch. Fluv. Nank., IX, 1885, pl. LXXII, fig. 140.—SIMPSON, Syn., 1900, p. 836.

Margaritana aurea PÆTEL, Conch. Sam., III, 1890, p. 172.

A small, inflated, decidedly rhomboid species, which would seem to be most nearly related to *P. harmandi*. I have never seen it.

Group of *Pseudodon vondembuschianus*.

Shell rather large, somewhat compressed, subsolid, elliptic-rhomboid, wider behind, where it is widely biangulate; teeth compressed.

PSEUDODON VONDEMBUSCHIANUS (Lea).

Shell irregularly subrhomboid, scarcely subsolid, subcompressed or convex, inequilateral; beaks only moderately full or high; posterior ridge sometimes faintly double, ending in a blunt point below the median line; dorsal outline nearly straight or lightly curved, raised into a low wing behind; anterior end a little narrowed, rounded, angled above; base line curved, fullest behind the middle; dorsal slope obliquely truncated; surface nearly smooth; epidermis pale olive-green, smoky, darker and a little rougher on the dorsal slope; teeth one in each valve, subcompressed, smooth; dorsal scars deep; muscle scars shallow; nacre dull, lurid purplish, often blotched in the cavities.

Length 72, height 44, diam. 20 mm.

Java; Sumatra; Borneo; Malacca.

Margaritana vondembuschiana Lea, Pr. Am. Phil. Soc. I, 1840, p. 288; Tr. Am. Phil. Soc., VIII, 1842, p. 222, pl. xviii, fig. 39; Obs., III, 1842, p. 60, pl. xviii, fig. 39.—Kuster, Conch. Cab. Unio, 1862, p. 295, pl. xcviii, fig. 3.

Margaron (Monocondylæa) vondembuschiana Lea, Syn., 1852, p. 45; 1870, p. 73.

Monocondylæa vondembuschiana H. and A. Adams, Gen. Rec. Moll., II, 1858, p. 501.

Pseudodon vondembuschiana Conrad, Am. Jl. Conch., I, 1865, p. 233.

Pseudodon vondembuschianus Simpson, Syn., 1900, p. 836.

Monodontina buschiana Conrad, Pr. Ac. N. Sci. Phila., VI, 1853, pp. 269, 449.

Unio von buschea Sowerby, Conch. Icon., XVI, 1866, pl. li, fig. 269.

Alasmodonta crispata Mousson, L. and W. Moll. Java, 1849, p. 97, pl. xviii, figs. 1, 2.

Margaritana crispata Pætel, Conch. Sam., III, 1890, p. 173.

Monocondylæa planulata Lea, Pr. Ac. N. Sci. Phila., XI, 1859, p. 187; Jl. Ac. N. Sci. Phila., IV, 1859, p. 262, pl. xlii, fig. 142; Obs., VII, 1860, p. 80, pl. xlii, fig. 142.—?Kuster, Conch. Cab. Unio, 1862, p. 305, pl. c, fig. 8.

Pseudodon planulata Conrad, Am. Jl. Conch., I, 1865, p. 233.

Margaron (Monocondylæa) planulata Lea, Syn., 1870, p. 73.

Microcondylæa planulata Pætel, Conch. Sam., III, 1890, p. 175.

Margaritana fragilis Kuster, Conch. Cab. Unio, 1862, p. 295, pl. xcviii, fig. 2.

Microcondylæa fragilis Pætel, Conch. Sam., III, 1890, p. 175.

Monocondylæa rhomboidea Kuster, Conch. Cab. Unio, 1862, p. 304, pl. c, fig. 7.

This species grows larger than the measurements given, which are from the type. All the specimens I have seen have a smoky epidermis.

PSEUDODON ELLIPTICUS Conrad.

Shell almost elliptical, inclining a little towards being rhomboid, scarcely subsolid, convex, inequilateral; beaks not prominent; posterior ridge inclined to be double, ending at and below the median line in a faint biangulation; anterior end a little narrowed, rounded; basal and dorsal lines curved; post-dorsal slope subtruncated; surface nearly smooth, sometimes having a few feeble wrinkles on the dorsal slope; epidermis pale tawny or horn colored, with dark rest marks, greenish and having one or two faint rays on the dorsal slope, shining; teeth one in each valve, subcompressed, rounded, smooth; dorsal scars deep, forming a row under the beaks; muscle scars shallow; nacre dull, lurid purplish, slightly iridescent behind.

Length 79, height 48, diam. 24 mm.

Cambodia.

Pseudodon ellipticum CONRAD, Am. Jl. Conch., I, 1865, p. 352, pl. XXV, fig. 1.—SIMPSON, Syn., 1900, p. 836.

Two fine shells of this species from the Laos Mountains, Cambodia, are in the Lea collection with other specimens, all bearing the name of *Monocondylæa cumingii.* As Conrad has pointed out, it is more elliptical, is smoother, is regularly rounded below and lighter colored than *cumingii.* One of these has slight posterior plications. The color is peculiar.

PSEUDODON ZOLLINGERI (Mousson).

Shell long rhomboid, convex, subsolid, inequilateral; beaks apparently not prominent; posterior ridge double, curved, ending in a wide biangulation from the median line to the base; dorsal and post-dorsal outlines curved, the elevation being most prominent at the end of the ligament; base line straight, sometimes a little incurved; anterior end rounded; surface rather rough, the epidermis being brown and somewhat concentrically wrinkled or lamellose; teeth one in each valve, rather stout, elevated and rounded, subcompressed; nacre brownish.

Length 77, height 45, diam. 26 mm.

Java.

Alasmodonta zollingeri MOUSSON, L. and Suss. Moll. Java, 1849, p. 96, pl. XVIII, fig. 2.

Margaritana zollingeri KUSTER, Conch. Cab. Unio, 1862, p. 294, pl. XCVIII, fig. 1.

Pseudodon zollingeri SIMPSON, Syn., 1900, p. 837.

Monocondylæa zollingeri PÆTEL, Conch. Sam., III, 1890, p. 174.

There is no reference to any plate or figures in the description of this species given by Mousson, but the three figures on plate XVIII, are probably intended to represent it. Number 1 is probably some other species, while 2 represents an elongated rhomboid shell with a double posterior ridge, which is quite strongly developed, and ends in a wide, decided biangulation behind. I have before me an author's specimen of *Alasmodonta zollingeri*, from the Morelet collection, which exactly agrees with Mousson's figure 2 on the plate XVIII of the "Mollusken von Java."

PSEUDODON INOSCULARIS (Gould).

Shell irregularly rhomboid, rather solid, slightly inflated, the greatest inflation being just behind the middle of the shell, inequilateral; beaks not prominent; posterior ridge high, double, ending in a wide, distinct biangulation at and below the median line; anterior end somewhat narrowed, rounded; base line almost evenly curved; post-dorsal outline high and almost angled behind the ligament, subtruncate behind; surface with irregular growth lines and sometimes with a few, faint, subradial plications on the dorsal slope; epidermis tawny-brown, subshining; teeth single in each valve, blunt and rounded; dorsal scars few, forming a row under the beaks, deep; muscle scars shallow; nacre lurid brownish.

Length 74, height 48, diam. 25 mm.

River Salwen, British Burma.

Anodon inoscularis GOULD, Pr. Bost. Soc. N. H., I, 1844, p. 160.—HANLEY and THEOBALD, Conch. Ind., 1876, p. 5, pl. IX, fig. 2.

Margaron (Monocondylæa) inoscularis LEA, Syn., 1870, p. 73.

Margaritana inoscularis PÆTEL, Conch. Sam., III, 1890, p. 173.

Pseudodon inoscularis SIMPSON, Syn., 1900, p. 837.

Close to *P. cumingii,* but shorter, solider and a little fuller. I have before me a single specimen and a valve belonging to the Lea collection bearing the name *An. inoscularis*, from the author of the species. It is considerably more solid and inflated than *P. vondembuschianus*.

PSEUDODON CUMINGII (Lea).

Shell irregularly subrhomboid, convex, scarcely subsolid, inequilateral; beaks not prominent; posterior ridge rather full, rounded or imperfectly double, ending in a blunt point or a feeble biangulation near the base; anterior end somewhat narrowed, rounded; dorsal line curved; dorsal slope obliquely subtruncate; base curved, fullest about at the middle; surface with irregular growth lines; epidermis brownish to blackish, smooth and shining, though slightly smoky; teeth single in each valve, subcompressed, smooth; dorsal scars deep; muscle scars well marked; nacre bluish or purplish, sometimes brown tinted.

Length 85, height 53, diam. 26 mm.

Malacca; Perak; Siam; Cambodia.

Anodonta cumingii LEA, Pr. Zool. Soc. Lond., 1850, p. 199.—MUSGROVE, Phot. Conch., 1863, pl. I, fig. 6.

Magaron (Monocondylæa) cumingii LEA, Syn., 1852, p. 50, 1870, p. 73.

Monocondylæa cumingii LEA, Jl. Ac. N. Sci. Phila., IV, 1860, p. 235, pl. XXXIII, fig. 114; Obs., VII, 1860, p. 53, pl. XXXIII, fig. 114.

Anodon cumingii REEVE, Conch. Icon., XVII, 1870, pl. XXXI, fig. 122.

Microcondylæa cumingii CLESSIN, Conch. Cab. Ano., 1876, p. 259, pl. LXXXIII, figs. 3, 4.

Pseudodus cumingii DE MORGAN, Bull. Soc. Zool. de Fr., X, 1885, p. 422.

Pseudodon cumingii SIMPSON, Syn., 1900, p. 837.

Very close to *P. vondembuschianus*, but darker colored, rather more solid and inflated and having a higher posterior ridge. It is quite probable that a large series from different localities would show that the two intergraded.

PSEUDODON ÆNEOLUS Drouet.

Shell elliptic rhomboid, subcompressed, subsolid, inequilateral; beaks low and subcompressed; dorsal outline lightly curved, ending in a low wing behind; dorsal slope subtruncate; base line arcuate, fullest behind the middle; anterior end rounded, narrowed; posterior ridge widely double, ending in a biangulation at and below the median line; surface often having subvertical folds, also radial plications on the dorsal slope but these are sometimes nearly or quite obsolete in adult shells; epidermis brownish or coppery, with metallic tints on the disk, subshining; teeth single in each valve, small, smooth; dorsal scars deep; muscle scars shallow but distinct; nacre livid, coppery, purplish or salmon-tinted, slightly iridescent.

Length 65-70, height 38-40, diam. 18-20 mm.

Borneo.

Pseudodon æneolus DROUET, Jl. de Conch., XL, 1892, p. 94.—DROUET and CHAPER, Mem. Soc. Zool. de Fr., V, 1892, p. 152, pl. VI, figs. 4-7.—SIMPSON, Syn., 1900, p. 837.

Very close to *P. vondembuschianus*, but more solid and more coppery-colored. The plications do not seem to be constant.

PSEUDODON RESUPINATUS von Martens.

"Shell oblong, moderately thick, quite compressed, sculptured on the posterior and upper parts with radiating folds, curved and ascending towards the margin and more or less subdivided, elsewhere smooth; epidermis black, somewhat shining; anterior margin rounded; posterior dorsal margin curved as far as the sinulus, thence oblique and straight; posterior end sub-biangulate, quite short, perpendicular; ventral margin straight, in old shells slightly sinuate; cardinal teeth single in both valves, thick, obtuse; posterior cardinal somewhat thick, obtuse; sinulus inequilateral, low, obtuse-angled; nacre bluish-pearly; anterior muscular impressions deep, posterior superficial, anterior accessory impression quite deep.

Length 73, height, vertical 32, alæ 38, diam. 22 mm. Beaks situated at 1/5 of the length." (von Martens).

Type locality, Than-Hoi, Tonkin.

Pseudodon resupinatus VON MARTENS, Nachr. Deutsch. Mal. Ges., 1902, p. 131.

"Nearest to *Ps. aeneolus* Drouet from Borneo, but proportionately longer and with more strongly impressed sculpture. These two Pseudodons are, to my knowledge, the only ones with the folds bent upwards on the posterior surface and almost deserve to be put in a small group, resembling the genus *Ptychorhyncus* Simp., in which *Unio apicellatus* Heude invites comparison, but they have no indications of lateral teeth, only a stout, somewhat swollen hinge margin as in *M. margaritifera* L.; whereas both in Simpson's generic diagnosis and in Heude's figures the usual lateral teeth of *Unio* clearly appear; to be sure, Heude says of many of his species that they properly belong to *Alasmodonta*, but this is in contradiction of his figures.

The intensity of the sculpture seems to be variable; on one mature example, in addition to the upward curved folds on the hinder part, there are in the middle a few almost vertical wrinkles, slightly curved forwards, that are wholly wanting in others; on two somewhat smaller specimens which, however, can not be considered as young, the characteristic upward curved folds are as feeble as in Heude's figure of *apicellatus*, but they are decidedly stronger on the example on which I base my description. On one specimen I count but two, on another four small, rounded muscular impressions."

PSEUDODON TUMIDUS (Morelet).

Shell nearly elliptical, inflated, rather thin, inequilateral; beaks full and elevated; dorsal outline generally rounded, having a deeply impressed lunule in front and a slight prominence just at the end of the ligament; anterior end somewhat narrowed, rounded; base line evenly curved, not quite so full as the dorsal outline; posterior ridge high, narrowly rounded, ending in a blunt point just below the median line; epidermis yellowish-brown in young shells, chestnut in adults; teeth single in each valve, rather strong, smooth; nacre bluish-white, fulvous under the beaks.

Length 70, height 46, diam. 34 mm.

Siam; Cambodia.

Monocondylus tumidus Morelet, Jl. de Conch., XIV, 1866, p. 62.—Mabille, Rev. Zool., XXIII, 1872, p. 51, pl. v, figs. 6, 7.

Pseudodon tumidus Morelet, Ser. Conch., IV, 1875, p. 337, pl. xvi, fig. 1.—Simpson, Syn., 1900, p. 837.

There is an old, somewhat eroded, dead shell in the Lea collection from Haines labelled *Monocondylæa inoscularis,* Siam, which is not Gould's species I am sure, but may be the above. It is 110 millimeters in length, 70 in height and 45 in diameter. The earlier growth lines conform to those of Morelet's shell, but in the later ones the posterior point is somewhat drawn down, as is often the case with old shells. The species may be distinguished from allied forms by its inflation, its nearly elliptical form and the high, narrow posterior ridges.

Pseudodon ovalis Morlet.

Shell elliptic rhomboid, rather short, subcompressed, thin, inequilateral; beaks low; posterior ridge full, widely rounded, ending bluntly behind, a little above the base; anterior end very slightly narrowed, rounded; base line evenly curved; dorsal outline curved, produced into a low wing behind; dorsal slope obliquely subtruncate; epidermis with decided, concentric, striæ, brown, slightly shining; teeth rather small, smooth; muscle scars rather deep; nacre bluish with blotches of pale orange, iridescent.

Length 75, height 53, diam. 19 mm.

Srakeo River, Siam.

Pseudodon ovalis Morlet, Jl. de Conch., XXXVII, 1889, p. 197, pl. vii, fig. 3.—Simpson, Syn., 1900, p. 837.

I have never seen this species, but it seems to be well distinguished from all the others by its short, elliptical, rhomboid form, small teeth and blue nacre blotched with pale orange.

Pseudodon thomsoni Morlet.

Shell irregularly long obovate, scarcely inflated, thin, inequilateral; beaks moderately inflated; dorsal outline slightly and irregularly curved; anterior end narrowed and rounded; base line almost straight throughout its anterior half, full and rounded at and behind the middle; posterior ridge very faintly, widely double, ending at and below the median line in a wide, faint biangulation; dorsal slope rather abruptly subtruncate; surface pale chestnut, the epidermis subject to exfoliation; teeth small; nacre pale orange under the beaks, becoming rosy white in the disk, iridescent and ornamented with feeble, transverse striæ.

Length 53, height 32, diam. 19 mm.

Cambodia.

Pseudodon thomsoni Morlet, Jl. de Conch., XXXII, 1884, p. 401, pl. xiii, figs. 2, 2a.—Simpson, Syn., 1900, p. 838.

Margaritana thomsoni Pætel, Conch. Sam., III, 1890, p. 174.

Morlet states that this shell has feeble laterals. I cannot be certain that it is a *Pseudodon*. It is possibly a species of *Hyriopsis*.

Pseudodon salwenianus (Gould).

Shell rhomboid elliptical, compressed or convex, subsolid, inequilateral; beaks only moderately elevated; dorsal outline lightly arcuate; anterior end rounded; base line lightly curved; posterior end obliquely truncate, joining the dorsal end with an angle; posterior ridge strongly and angularly developed; ending in a blunt point near the base; dorsal slope radiately plicate; epidermis blackish; muscle scars shallow; nacre sublivid.

Length 140, height 64, diam 31.5 mm.

River Salwen, British Burma.

Anodon salweniana Gould, Pr. Bost. Soc. N. Hist., I, 1844, p. 160.

Anodonta salweniana Gould, Otia Conch., 1862, p. 193.

Pseudodon salweniana Conrad, Am. Jl. Conch., I, 1865, p. 233.

Monocondylæa salweniana Pætel, Conch. Sam., III, 1890, p. 174.

Unio salwenianus Sowerby, Conch. Icon., XVI, 1868, pl. xciv, fig. 513.

Margaron (Monocondylæa) salweniana Lea, Syn., 1870, p. 72.

Pseudodon salweenianum HANLEY and THEOBALD, Conch. Ind., 1876, p. 5, pl. IX, fig. 4.

Pseudodon salwenianus SIMPSON, Syn., 1900, p. 838.

Sowerby and Hanley and Theobald figure what they believe is the above species, but the measurements given by Gould are for a shell much longer in proportion to its height than theirs. The species would seem to be easily distinguishable by its considerable length, and the strong posterior plication. I am doubtful whether the figures in the Conchologia Indica and the Conchologia Iconica really are taken from Gould's shell.

PSEUDODON MORELETI Crosse and Fischer.

Shell large, subrhomboid, subinflated, rather solid, inequilateral; beaks full, wide, moderately prominent; posterior ridge full, widely rounded, with one or two small, distinct ridges above; anterior end a little narrowed, rounded; base lightly curved or straight; posterior end obliquely subtruncate above, rounded below; surface with irregular growth lines; epidermis dark brown, somewhat shining, roughened on the border of the shell and behind; teeth single in each valve, not large, smooth and subcompressed; dorsal scars forming a row under the beaks; anterior scars impressed; posterior scars large, semicircular, shallow; nacre pale purplish, iridescent behind.

Length 124, height 80, diam. 48 mm.

Cambodia.

Monocondylæa tumida DESHAYES and JULLIEN, Nouv. Arch. de Mus., 1874, p. 117, pl. V, figs. 1-3.

Pseudodon moreleti CROSSE and FISCHER, Jl. de Conch., XXV, 1876, p. 330.—SIMPSON, Syn., 1900, p. 838.

A magnificant specimen of this species with the above measurements is in the National Museum Collection from Cambodia. It is the largest *Pseudodon* I have seen. The form is slightly obovate, inclining to rhomboid; the nacre is pale purple and differs in color from that of any species I am acquainted with. Deshayes and Jullien figured both shell and animal of this species beautifully in the Nouvelles Archives du

Museum under the name *Monocondylæa tumida* of Morelet, which is quite a different species, and Fischer and Crosse gave it a new name.

PSEUDODON CAMBODJENSIS (Petit).

Shell subtriangular, subsolid, convex, inequilateral; beaks low, compressed; posterior ridge full, rounded, ending bluntly at the base of the shell; anterior end narrowed, rounded; dorsal outline curved, carried into a low wing behind; dorsal slope strongly and obliquely truncated; base line nearly straight; surface with irregular, concentric growth lines, ashy-brown or greenish-brown, subshining; teeth single in each valve, large, elevated, subtriangular; dorsal scars forming a row under the beaks; muscle scars irregular, impressed; nacre flesh-colored, somewhat silvery; ligamental patch large, dark, triangular. Behind the teeth of old shells the epidermal matter covers the hinge plate.

Length 107, height 72, diam. 31 mm.

Cambodia; Tonkin.

Monocondylæa cambodjensis PETIT, Jl. de Conch., XIII, 1865, p. 16, pl. IV, fig. 4.

Margaron (Monocondylæa) cambodjensis LEA, Syn., 1870, p. 72.

Pseudodon cambodjensis SIMPSON, Syn., 1900, p. 838.

The National Museum possesses a fine series of shells of this species, young and old. The young shells are rather thin, but they become quite strong with age. The young shells are more obovate and less distinctly triangular than those of the adults. The peculiar form will distinguish this species.

PSEUDODON CHAPERI (de Morgan).

Shell subrhomboid, somewhat inflated, solid, inequilateral; beaks only moderately full or high; posterior ridge widely and decidedly double, ending at the median line and near the base; anterior end narrowed and rounded; base line lightly curved; dorsal line curved from the anterior end to the median line behind, fullest just behind the ligament; surface covered with strong, concentric ridges; epidermis thick, brownish. There is a low, radial ridge on the posterior slope midway between the upper part of the posterior ridge and the dorsal line, that ends in a slight angle behind; hinge with a strong, very prominent, triangular tooth in each valve; anterior muscle scars well marked; posterior scars shallow; dorsal scars six in each valve, forming a row under each beak, deep; nacre grayish-white.

Length 84, height 48, diam. 38 mm.

Cambodia; Siam.

Pseudodus chaperi DE MORGAN, Bull. Soc. Zool. de Fr., X, 1885, p. 423, pl. IX, figs. 1, 2.

Pseudodon chaperi SIMPSON, Syn., 1900, p. 838.

de Morgan places this species and the *Anodonta cumingii* Lea in the genus *Pseudodus* and credits the genus to Gould, who bestowed the name *Pseudodon* on the group of oriental *Naiades* having a single large tooth in each valve and practically wanting laterals. The author of this species describes it as having very long laterals, but they probably are rudimentary, as the shell seems to be a *Pseudodon*. Its distinguishing characters are its strong, concentric sculpture and the decidedly wide, double posterior ridge.

PSEUDODON WALPOLEI (Hanley).

Shell irregularly rhomboid, considerably narrowed in front, convex, rather solid, inequilateral; beaks moderately elevated, not inflated; posterior ridge full, rounded, ending in a blunt point at the base of the shell; above it there are two or more faint, radial ridges, the middle part of the dorsal slope is irregularly and strongly plicate; anterior end narrowed and rounded, subangulate above; base line straight or lightly arcuate; hinge line curved a little; outline of dorsal slope obliquely rounded, angled behind the ligament; teeth single in each valve, small and but little elevated; dorsal scars few, placed in a row under the beaks; muscle scars shallow; nacre lurid purplish; ligamental sinus well marked.

Length 55, height 32, diam. 19 mm.

Borneo.

Monocondylæa walpolei HANLEY, Proc. Zool. Soc. Lond., 1871, p. 587.—SIMPSON, Syn., 1900, p. 840.

Since the Synopsis was written the National Museum has received three fine specimens of what are undoubtedly this species from Sarawak, Borneo. The epidermis is reddish-brown and shining, and there are traces of radial sculpture on the anterior end of the shell. Above the corrugated area on the dorsal slope there is a narrow, smooth zone reaching to the ligament. The incremental striæ are not very strong in these shells. Walpole states that the basal margin is incurved in the middle. The type is a little larger than the measurements given above.

Section BINEURUS Simpson, 1900.

Bineurus SIMPSON, Syn., 1900, p. 839.

Shell elongate rhomboid, thin, rounded in front, widely and feebly biangulate behind, having two or more raised, radiating lines on the posterior slope, which is slightly, obliquely wrinkled; beaks low; surface finely, irregularly, concentrically grooved; epidermis olive; teeth smooth, compressed; nacre bluish. Animal unknown.

Type, *Monocondylæa mouhoti* Lea.

PSEUDODON MOUHOTI (Lea).

Shell elongated, subrhomboid, slightly narrowed in front, subcompressed, rather thin, inequilateral; beaks subcompressed, not prominent; posterior ridge wide, rounded; dorsal outline lightly curved; anterior end rounded; base nearly or quite straight; dorsal slope obliquely truncated; posterior end rounded below; growth lines somewhat strong and irregular; epidermis greenish-brown often marked or shaded green on the dorsal slope; teeth small, rounded, subcompressed, single in each valve; nacre bluish, lurid purplish in the cavities, iridescent behind; muscle scars shallow.

Length 67, height 34, diam. 18 mm.

Cambodia; Siam.

Monocondylæa mouhoti LEA, Pr. Ac. N. Sci. Phila., VII, 1863, p. 190.

Pseudodon manhoti CONRAD, Am. Jl. Conch., I, 1865, p. 233.

Monocondylæa mouhotiana LEA, Jl. Ac. N. Sci. Phila., VI, 1866, p. 65, pl. XXI, fig. 62; Obs., XI, 1867, p. 69, pl. XXI, fig. 62.—CLESSIN, Conch. Cab. Ano., 1876, p. 261, pl. LXXXII, figs. 1, 2.

Margaron (Monocondylæa) mouhotiana LEA, Syn., 1870, p. 73.

Unio mouhotianus SOWERBY, Conch. Icon., XVI, 1868, pl. XCII, fig. 503.

Pseudodon mouhotianus MORELET, Ser. Conch., IV, 1875, p. 339.

Pseudodon mouhoti SIMPSON, Syn., 1900, p. 839.

Elongated, rather thin and subcompressed. It does not seem to be as much inflated as *P. exilis*.

PSEUDODON EXILIS (Morelet).

Shell elongate. subrhomboid, inequilateral, thin, convex or subinflated; beaks not prominent; anterior end narrowed and rounded; dorsal outline lightly curved; dorsal slope obliquely tuncated; base line almost straight, full behind the middle; posterior ridge widely rounded; posterior end rounded below; surface with strong growth lines; epidermis tawny-brown; teeth single in each valve, small, compressed; nacre bluish, fulvous in the cavities.

Length 57, height 30, diam. 18 mm.

Perak.

Monocondylus exilis MORELET, Jl. de Conch., XIV, 1866, p. 63.

Pseudodon exilis MORELET, Ser. Conch., IV, 1875, p. 340, pl. XVII, fig. 1.—SIMPSON, Syn., 1900, p. 839.

I suspect that this is merely a variety of *P. mouhoti*. The beaks are not quite so near the anterior end as they are in that species, the shell is more tawny, more strongly, obliquely truncate on the dorsal slope, and more inflated.

PSEUDODON AVA (Theobald).

Mandelay, Burma.

Monocondylæa ava THEOBALD, Jl. As. Soc. Beng., XLII, Pt. 2, 1873, p. 209, pl. XVII, fig. 15.

Pseudodon ava SIMPSON, Syn., 1900, p. 839.

The description of this species is not accessible to me. I am not certain that it belongs in this group.

PSEUDODON BICRISTATUS (Strubell).

"Shell almost regularly ovate, rather thin, small, scarcely inflated, lightly striate, not very shining, olivaceous-brown. Anterior end short; posterior end moderately elongated, dilated, the greatest height being at the postero-dorsal angle. Dorsal margin short, almost straight, ascending, forming a distinct angle posteriorly, an indistinct one in front; anterior end very shortly rounded; basal margin scarcely curved, slightly ascending posteriorly, forming with the posterior margin a short, biangulated, truncated beak. Umbones anterior, depressed, widely, but superficially, eroded; areola none; area elongate, compressed, distinctly bicarinate, carinæ prominent at the posterior margin; ligament narrow, almost covered. Hinge very narrow, teeth almost obsolete, lateral narrow; muscular impressions superficial; nacre bluish, livid towards the umbones.

Length 42, height 25, diam. 12 mm." (Strubell).

Type locality, South Sumatra.

Microcondylæa bicristata STRUBELL, Nachr. D. Mal. Ges., 1897, p. 9.

I am indebted to the courtesy of Dr. F. Haas for the correct generic position of this species.

Section NASUS Simpson, 1900.

Nasus SIMPSON, Syn., 1900, p. 839.

Shell somewhat solid, rather inflated, much elongated, with a well-developed posterior ridge, with a low, faint one above it, bluntly pointed at post-basal part; beaks not high, eroded in the specimens seen; epidermis dark; teeth compressed, high.

Animal unknown.

Type, *Pseudodon nankingensis* Heude.

PSEUDODON NANKINGENSIS (Heude).

Shell rather thin, long elliptical, inflated, inequilateral; beaks not elevated; posterior ridge high, subangulate; anterior end rounded; dorsal and ventral outlines lightly curved; posterior end bluntly pointed or rounded, somewhat drawn out; surface with strong, irregular, concentric growth lines; epidermis dark brown or blackish, subshining; teeth single in each valve, small but elevated, rounded, compressed; muscle scars shallow; nacre whitish; pallial line sinused behind.

Length 62, height 26, diam. 20 mm.

Rivers of Nankin.

Monocondylæa nankingensis HEUDE, Jl. de Conch., XXII, 1874, p. 116; Conch. Fluv. Nank., I, 1875, pl. IV, fig. 9.

Pseudodon nankingensis SIMPSON, Syn., 1900, p. 839.

Monocondylæa nanquinensis PÆTEL, Conch. Sam., III, 1890, p. 174.

A single, badly worn author's specimen of this species is in the National Museum collection, which is more pointed behind than the figure. It is much inflated and the umbonal region is scarcely elevated above the general outline.

PSEUDODON SECUNDUS Heude.

Shell subsolid, elongated, subrhomboid, inflated, inequilateral; umbonal region slightly elevated; posterior ridge strong, subangled, ending in a point near the base line; anterior end rounded; dorsal outline lightly curved; base line nearly straight; posterior slope obliquely subtruncate; epidermis brownish, somewhat shining; teeth single in each valve, subcompressed, triangular, elevated; muscle scars well marked; nacre bluish-tinted, dirty flesh-color in the cavities; pallial line having a distinct sinus behind.

Length 82, height 30, diam. 30 mm.

Length 73, height 33, diam. 25 mm.

River Hoæ, China.

Pseudodon secundus HEUDE, Conch. Fluv. Nank., III, 1877, pl. XVIII, fig. 38.—SIMPSON, Syn., 1900, p. 840.

Unio secundus PÆTEL, Conch. Sam., III, 1890, p. 167.

The first of the above measurements is that given by Heude and I am inclined to think that the diameter is too large in proportion to the rest of the shell. The second measurement is from an author's shell in the National Museum. The species is close to *nankingensis*, but is more solid, less elongated in proportion, and has lighter colored, smoother epidermis.

Section OBOVALIS Simpson, 1900.

Obovalis SIMPSON, Syn., 1900, p. 840.

Shell obovate, subinflated, with a low, rounded posterior ridge and with radiating wrinkles on the posterior slope; disk nearly free from wrinkles; epidermis blackish; there is a high, triangular tooth in each valve; laterals very faint, rounded; nacre coppery.

Type, *Pseudodon loomisi* Simpson.

PSEUDODON LOOMISI Simpson.

Shell slightly rhomboid, obovate, convex, scarcely subsolid, inequilateral; beaks moderately full, but little elevated; posterior ridge rounded, ending below the median line in a blunt point; dorsal border lightly arcuate; basal line curved; anterior end rounded, subangular above; dorsal slope obliquely subtruncate; surface with irregular growth lines, which become rather strong ridges in front, radiately plicate on the dorsal slope; epidermis nearly black, somewhat sericeous where not worn; left valve with one tooth and a vestigial one in front of it; right valve with a single tooth; teeth elevated; laterals reduced to a rounded ridge; anterior scars impressed; posterior scars shallow; dorsal scars on the under side of the hinge plate; nacre bluish, becoming dull purplish in the cavities, somewhat iridescent; pallial line with a posterior sinus.

Length 67, height 36, diam. 22 mm.

Japan.

Pseudodon loomisi SIMPSON, Pr. Ac. N. Sci. Phila., 1900, p. 84, pl. IV, fig. 7; Syn., 1900, p. 840.

There is a single shell, the type, in the National Museum collection. It differs from all other species of *Pseudodon* in its obovate, elongated outline and radial plications on the dorsal slope.

SPECIES INCERTÆ SEDIS.

PSEUDODON SOLIDUS Haas.

"Shell long-elliptical, solid, heavy, quite compressed; anterior upper margin curved, uniting without an angle the short, steep anterior end, which curves gently into the slightly curved, almost horizontal ventral margin. Posterior end nearly perpendicular; posterior slope curved; posterior dorsal margin at first straight, then rather sharply curved where it joins the posterior margin. Beaks situated at 21-100 of the total length, quite swollen, extending slightly above the posterior dorsal margin and very much above the anterior dorsal margin, eroded, showing, however, remnants of a sculpture consisting of close, concentric ridges. Posterior slope quite high, somewhat compressed, posterior ridge indistinct. Areola small, ligament long, strong, half-covered. Simulus broad lanceolate, cutting deep into the beaks. Sinus not recognizable. Epidermis brownish-black, lighter towards the beaks. Outline from above narrow lanceolate, decreasing quite regularly in thickness from front to rear. Hinge with two, blunt, tooth-like projections, that in the right valve obtusely triangular, quite high and stands in front of the beak, while that of the left valve is longer and is situated under the beak. Anterior muscular impressions deep, confluent, (that of the lower retractor is very large, almost separated), the posterior impressions are shallow and confluent. The dorsal muscular impressions, 4-6, lie in a groove in the beak cavity. Nacre porcellaneous, bluish-white, slightly iridescent.

Length 92, greatest height 54, at beaks 45, diam. 31.5 mm." (Haas).

Type locality, Hunan, Central China.

Pseudodon solidus Haas, Nachr. Deutsch. Mal. Ges., 1911, p. 46.

Pseudodon ponderosus Preston.

"Shell solid, moderately convex, sub-trapezoidal, covered with a coarse, black, scaly periostracum, which becomes laminiferous towards the posterior side; anterior side bluntly rounded; posterior side rounded above, somewhat rostrate below; dorsal margin slightly arched; ventral margin almost straight; umbones large, prominent; interior of shell nacreous, iridescent, tinged with pinkish mauve, deepening posteriorly.

Length 117, height 66 mm." (Preston).

Type locality, Nan-ko, Siam.

Pseudodon ponderosa Preston, Pr. Mal. Soc. London, VIII, 1909, p. 202, pl. VIII, fig. 1.

The following are unfigured or indeterminate species.

Spatha compressa von Martens, Proc. Zool. Soc. Lond., 1860, p. 66. Siam.

Pseudodon sulcatum Rochebrune, Bull. Soc. Phil., 7th ser., VI, 1882, p. 41. Mekong River, Cochin China.

Pseudodon pierrei Rochebrune, Bull. Soc. Phil., VI, 1882, p. 41. Cochin China.

Pseudodon mabilli Rochebrune, Bull. Soc. Phil., VI, 1882, p. 41. Cochin China, Cambodia.

Pseudodon anodontinum Rochebrune, Bull. Soc. Phil., VI, 1882, p. 41. Cambodia.

Genus PARREYSIA Conrad, 1853.

Parreysia Conrad, Pr. Ac. N. Sci. Phila., VI, 1853, p. 267.—Ortmann, Ann. Car. Mus., VIII, 1912, p. 276.

Shell solid, inflated, oval to subrhomboid, with full, high, zigzag, radially sculptured beaks, the sculpture often extending over the disk; epidermis smooth and bright, sometimes a little rayed; with two irregular pseudocardinals in the left valve which are more or less broken into ragged denticles, or are strongly, vertically striate, and two laterals, the lower the larger; right valve with one, sometimes two pseudocardinals, the upper small, compressed, and a few tubercles behind them, with two laterals, the upper the larger; cavity of the beaks rather deep, not compressed; dorsal scars under the hinge, not visible; the two upper anterior muscle scars very deep, confluent, the lower linear; nacre white to salmon, iridescent behind.

Length 65, height 27.5, diam. 15.5 mm.

Type, *Unio multidentatus* Philippi.

In the above reference Conrad gives the name *Parreysia* and refers to *Unio multidentatus* Parreyss, which may be taken as the type. I do not know that he ever described the group.

The species, which I have placed in the above named assemblage, seem, so far as conchological characters show, to be closely related to *Nodularia*. Both groups, as I have constituted them, have numerous representatives in Tropical Africa and southeast Asia. The shells of this group are generally more solid, more inflated and shorter than those of *Nodularia*. The beaks and earlier growth, as a rule are rather more strongly sculptured with zigzag-radial ridges than are those of that genus and the pseudocardinals are heavier and more split up. In a great many species there are small tubercles on the hinge plate, behind the pseudocardinals. The beak cavities are, as a rule, deeper than those of the species of *Nodularia*.

Ortmann, (l. c.), from an examination of *P. wynegungænsis* Lea, remarks: "Soft parts partly primitive, partly more advanced. Super-anal separated from the anal by a well-developed mantle-connection, which is rather long. Inner lamina of inner gills entirely connected with the abdominal sac. All four gills are marsupial in the female, with well-developed septa and water-tubes, which latter are somewhat narrower in the outer gill than in the inner. In the male, the septa are distinctly more distant than in the female. During pregnancy, the gills swell but little, and the edges remain sharp, and the ovisacs remain simple. Placentæ subcylindrical, only slightly compressed, and not very solid. Glochidia not observed."

KEY TO THE GROUPS OF PARREYSIA.

Shell with imperfect laterals. Group of *P. biesiana*.
Shell generally having perfect laterals.
  Ovate, obovate or elliptical.
    Small, ovate with strong, concentric outer ridges.
      Group of *P. aurora*.
    Medium sized; beaks high, strongly sculptured; pseudocardinals strong and ragged.
      Group of *P. corrugata*.
    With a high, pinched-up posterior ridge.
      Group of *P. chinensis*.
    Beak sculpture very strong, extending part way over the disk, abruptly changing to concentric sculpture.
      Group of *P. bakeri*.

Elliptic rhomboid.
  Sculpture extending only part way over the disk. Group of *P. rugosa*.
  Nearly smooth or very finely sculptured. Group of *P. corbis*.
  Strongly sculptured. Group of *P. leopoldvillensis*.
Triangular.
  Posterior ridge high; surface sculptured. Group of *P. nyassænsis*.
  Beaks high; posterior ridge low. Group of *P. corrugata*.
Shell subquadrate, concentrically sculptured. Group of *P. molleuri*.
Shell rhomboid, very small, solid, inflated. Group of *P. fabagina*.

Subgenus PARREYSIA s. s.

Characters the same as the genus.

Group of *Parreysia corrugata*.

Shell having the middle of the basal region swollen, beak sculpture strong, the central ridges generally united at their lower points to form chevron-shaped markings.

PARREYSIA CORRUGATA (Müller).

Shell variable in outline, generally somewhat elliptical, subinflated or inflated, rather solid, more or less inequilateral; beaks full, quite elevated, sculptured with radial ridges, which are more or less zigzagged, and sometimes extend well out over the disk; anterior end more or less narrowed, rounded; base rounded, usually fullest behind the middle; dorsal outline arcuate; outline of dorsal slope obliquely subtruncate, sometimes obliquely rounded, with an angle where it meets the dorsal outline; posterior ridge usually full and subangulate, surface with irregular growth lines, which are developed into ridges in front; the upper anterior region and the dorsal slope often have irregular, radial plications; epidermis generally smooth and shining, yellowish, tawny, straw-colored or brownish with green, concentric bands, sometimes it is almost a uniform green; on the posterior slope there are generally two or three dark rays and there are rarely faint rays on the disk. Left valve with two ragged pseudocardinals and two laterals; right valve with two pseudocardinals and one lateral; there are usually a few tubercles behind the pseudocardinals; beak cavities rather deep; anterior scars impressed; nacre white, sometimes salmon-tinted in the cavity, iridescent behind; pallial line often with a trace of a posterior sinus.

Length 42, height 30, diam. 18 mm.
Length 43, height 30, diam. 21 mm.
Length 52, height 35, diam. 22 mm.
India.

Mya corrugata Müller, Verm. Terr. et Fluv., 1774, Pt. 2, p. 214; Besch. Ges. Nat. Ber. IV, 1779, p. 56, pl. III*b*, figs. 7, 8. —Schroter, Fluss, Conch., 1779, p. 181, pl. IX, fig. 3.—Wood, Gen. Conch., I, 1815, p. 108, pl. XXIV, figs. 1-3.—Mawe, Linn. Conch., 1823, pl. IV, fig. 3.—Wood, Ind. Test., 1825, p. 12, pl. II, fig. 31*a*; 1856, rev. ed., p. 16, pl. II, fig. 31.

Unio corrugata Lamarck, An. sans Vert., VI, 1819, p. 78.—Deshayes, Enc. Meth., II, 1827, p. 584, pl. CCXLVIII, fig. 8.

Unio (Potamida) corrugata Swainson, Tr. on Mal., 1840, p. 268, fig. 51; p. 281, fig. 57.

Unio corrugatus Retzius, Diss. Hist. Nat., 1778, p. 18.—Kuster, Conch. Cab. Unio, 1862, p. 289, pl. XCVII, figs. 3, 4.—Sowerby, Conch. Icon., XVI, 1868, pl. LXXI, fig. 360.—Hanley and Theobald, Conch. Ind., 1876, p. 21, pl. XLV, figs. 2-5.

Margarita (Unio) corrugatus Lea, Syn., 1836, p. 29; 1838, p. 21.

Margaron (Unio) corrugatus Lea, Syn., 1852, p. 20; 1870, p. 30.

Parreysia corrugata Simpson, Syn., 1900, p. 841.

Mya spuria Gmelin, Syst. Nat., 13th ed., 1788, p. 3222.

Mya gaditana Schreibers, Versuch., 1793, p.

Unio multidentatus Philippi, Conch. III, 1847, p. 46, pl. III, fig. 4.—Kuster, Conch. Cab. Unio., 1856, p. 136, pl. XXXVI, fig. 5.

Margaron (Unio) multidentatus Lea, Syn., 1870, p. 50.

Unio fulmineus PHILIPPI, Conch., III, 1847, p. 46, pl. III, figs. 5, 6.—KUSTER, Conch. Cab. Unio., 1862, p. 286, pl. XCVI, figs. 2, 3.

Unio lutens LEA, Pr. Ac. Nat. Sci. Phila., VIII, 1856, p. 93.

Unio luteus LEA, Jl. Ac. N. Sci. Phila., III, 1857, p. 291, pl. XXIV, fig. 4; Obs., VI, 1857, p. 11, pl. XXIV, fig. 4.

Margaron (Unio) luteus LEA, Syn., 1870, p. 46.

? Unio semirugatus CHENU, Ill. Conch., 1858, pl. XII, figs. 2, 2*a*.

Unio merodabensis KUSTER, Conch. Cab. Unio, 1861, p. 233, pl. LXXVIII, fig. 4.

Unio wynegungœnsis HANLEY and THEOBALD, Conch. Ind., 1876, p. 21, pl. XLV, fig. 6.

Unio tennenti HANLEY and THEOBALD, Conch. Ind., 1876, p. 22, pl. XLV, figs. 7-9.

Unio phayresi THEOBALD, manuscript.

The shells of this group are very variable and, it seems to me, have received far too many names at the hands of conchologists. I have given as varieties some of these and others have not seemed to me to be worthy even of that rank.

Müller's description of *Mya corrugata* is inadequate, but in the Beschaftigungen it is further discussed and characteristic figures are given of the species we know as *Unio corrugatus* of India.

The form that I take to be typical, and my views in this matter agree with those of Hanley and Theobald, is of moderate size, narrowed a little in front, rather full behind the middle of the base, rather smooth and shining. The beak sculpture consists of strong, radial ribs, which extend out on to the disk and are zigzagged below. Sometimes the beak sculpture is but slightly developed or absent in specimens, which seem to be typical in other respects.

Var. *lævirostris* (Benson).

According to the figures of Hanley and Theobald, this form is more elongated than the type, has quite full beaks, which may be strongly sculptured, and is not inflated behind the middle of the base. It appears to merge into the typical form.

Unio lævirostris BENSON, Ann. and Mag., 1862, p. 192.

Unio corrugatus var. *lævirostris* HANLEY and THEOBALD, Conch. Ind., 1876, p. 21, pl. XLIV, figs. 5, 6.

Parreysia corrugata var. *lævirostris* SIMPSON, Syn., 1900, p. 842.

Var. *nagpoorensis* (Lea).

A rather thin, somewhat elongated, subrhomboid form with reddish-brown, striate, rayless, epidermis. The type is in the Wheatley collection, and there are no examples in the Lea collection. It may be a valid species, but I am inclined to agree with Hanley and Theobald in considering it a variety of *corrugata*.

Nagpoor, Bengal; Burma?

Unio nagpoorensis LEA, Pr. Ac. N. Sci. Phila., III, 1859, p. 331; Jl. Ac. N. Sci. Phila., IV, 1860, p. 270, pl. XLV, fig. 150; Obs., VII, 1860, p. 88, pl. XLV, fig. 150.

Margaron (Unio) nagpoorensis LEA, Syn., 1870, p. 38.

Unio corrugatus Müll. var. *nagpoorensis* HANLEY and THEOBALD, Conch. Ind., 1876, p. 21.

Parreysia corrugata var. *nagpoorensis* SIMPSON, Syn., 1900, p. 842.

PARREYSIA WYNEGUNGÆNSIS (Lea).

Shell oblong, subrhomboid or subelliptical, slightly inflated, solid, inequilateral; beaks high, moderately full, sculptured strongly with zigzag-radial bars that extend well out on to the disk; posterior ridge rounded; anterior end rounded or often slopingly truncate above; base line curved, sometimes a little fuller behind the middle; dorsal outline arcuate; outline of dorsal slope obliquely rounded or subtruncate; surface with rather strong, concentric growth lines, the dorsal slope and sometimes the upper part of the anterior end having wrinkled sculpture; epidermis generally olive, often dark, occasionally banded faintly, subshining; pseudocardinals much torn and ragged; laterals two in the left valve, the lower the stronger, semidouble in the right valve; anterior scars deep; posterior scars shallow; beak cavities deep; nacre whitish, flesh-colored or salmon-tinted, thickened in front, iridescent behind.

Length 62, height 38, diam. 25 mm.

Length 61, height 40, diam. 22 mm.

Wynegunga River, Bengal.

Unio wynegungænsis LEA, Pr. Ac. N. Sci. Phila., III, 1859, p. 331; Jl. Ac. N. Sci. Phila., IV, 1860, p. 271, pl. XLV, fig. 151; Obs., VII, 1860, p. 89, pl. XLV, fig. 151.—SOWERBY, Conch. Icon., XVI, 1868, pl. LXVII, p. 339.

Margaron (Unio) wynegungænsis LEA, Syn., 1870, p. 50.

Parreysia wynegungænsis SIMPSON, Syn., 1900, p. 842.

More elongated, generally a little less inflated and darker colored than *corrugata*. The form is quite variable, subrhomboid to almost evenly elliptical. The variety *lævirostris* of *corrugata* approaches it, but is differently colored.

PARREYSIA FAVIDENS (Benson).

Shell rather large, heavy, somewhat inflated, irregularly elliptical or ovate, inequilateral; beaks high, full and large, sculptured with strong, zigzag-radial ridges, which usually do not extend on to the disk; posterior ridge well marked; narrowly rounded or subangulate, ending about on the median line in a blunt point; there is often a low, radial central elevation extending to the base of the shell, which is slightly produced where it ends; surface with strong, irregular growth lines, sometimes concentrically sculptured; epidermis tawny or brownish, sometimes banded with green, covered when fresh with a grayish bloom, occasionally feebly rayed; pseudocardinals strong and very much split up; there are often small tubercles behind them; laterals two in the left valve, with often a vestigial third one, double in the right valve, club-shaped; beak cavities deep; muscle scars impressed; nacre yellow-salmon, or white.

Length 70, height 50, diam. 33 mm.

India.

? Mya spuria WOOD, Ind. Test., 1825, p. 12, pl. II, fig. 35*a*.

Unio favidens BENSON, Ann. and Mag., X, 1862, p. 188.—HANLEY and THEOBALD, Conch. Ind., 1876, p. 6, pl. XI, fig. 1.—REEVE, Conch. Icon., XVI, 1865, pl. XXVI, fig. 131.

Margaron (Unio) favidens LEA, Syn., 1870, p. 38.

Parrcysia favidens SIMPSON, Syn., 1900, p. 842.

Unio favidens var. *marcens* BENSON, Ann. and Mag., X, 1862, p. 188.

Unio marcens HANLEY and THEOBALD, Conch. Ind., 1876, p. 19, pl. XLII, figs. 4-6.

Unio smaragdites BENSON, Ann. and Mag., X, 1862, p. 190.—HANLEY and THEOBALD, Conch. Ind., 1876, p. 5, pl. X, fig. 5.

Parreysia smaragdites PRESTON, Rec. Mus., VII, 1912, p. 299.

Several varieties, *marcens, trigona, deltæ, viridula* and *densa* are given by Benson, which hardly seem to me to be worth mentioning.

Var. *tripartita* (Lea).

Possibly worthy of a varietal name. Lea has two shells, one of them the type, in his collection. They are a very little more produced behind the middle than most of the shells of *favidens* and the epidermis is lighter colored. The nacre is more silvery and iridescent than in that species. The tripartite lateral of the left valve is a character often found in *favidens*.

Unio tripartitus LEA, Pr. Ac. N. Sci. Phila., VII, 1863, p. 190; Jl. Ac. N. Sci. Phila., VI, 1866, p. 57, pl. XIX, fig. 55; Obs., XI, 1867, p. 61, pl. XIX, fig. 55.

Margaron (Unio) tripartitus LEA, Syn., 1870, p. 35.

Parreysia favidens (part), SIMPSON, Syn., 1900, p. 843.

Var. *trirostris* (Musgrave).

Shell considerably produced at the anterior end, the central base and the posterior end. The epidermis is brown. Doubtfully worthy of varietal rank.

Unio trirostris MUSGRAVE, Hanley Phot. Conch., 1863, pl. II, fig. 9.—HANLEY and THEOBALD, Conch. Ind., 1876, p. 6, pl. XI, fig. 6.

Parreysia favidens, (part), SIMPSON, Syn., 1900, p. 842.

Var. *pinax* (Benson).

Shell smaller than the type, somewhat elongated. I quite agree with Hanley and Theobald in considering this a small variety of *favidens*.

Length 49, height 30 mm.

Unio pinax BENSON, Ann. and Mag., 1862, p. 192.

Unio favidens var. *pinax* HANLEY and THEOBALD, Conch. Ind., 1876, p. 6, pl. XI, fig. 2.

Parreysia favidens var. *pinax* SIMPSON, Syn., 1900, p. 843.

Var. *plagiosoma* (Benson).

Another small form with rather narrow elevated beaks, the general form being much like that of *favidens*.

Length 40, height 28 mm.

Unio plagiosoma BENSON, Ann. and Mag., X, 1862, p. 191.

Unio favidens var. *plagiosoma* HANLEY and THEOBALD, Conch. Ind., 1876, p. 6, pl. XI, fig. 3.

Parreysia favidens var. *plagiosoma* SIMPSON, Syn., 1900, p. 843.

Var. *assamensis* Preston.

"Shell more convex than the typical form, the dorsal margin is rather less posteriorly angled, the anterior side more rounded and the posterior slightly more nasute." (Preston).

Type locality, Digong; also Assam and Arrah.

Parreysia favidens var. *assamensis* PRESTON, Rec. Ind. Mus., VII, 1912, p. 299.

PARREYSIA BHAMOENSIS (Theobald).

Shell subtriangular, subinflated, solid, inequilateral; beaks high and full, with zigzag-radial sculpture, which does not extend over the disk; posterior ridge narrowly rounded, ending in a point below the median line; anterior end and base evenly rounded; outline of dorsal slope arcuate but higher just behind the ligament; surface with irregular growth lines, usually corrugated on the upper anterior part and the dorsal slope, green-brownish and yellowish-banded, shining; hinge solid; pseudocardinals ragged; laterals split, sometimes into three divisions in each valve; beak cavities very deep, compressed; muscle scars deep; nacre silvery.

Length 50, height 38, diam. 22 mm.

Burma.

Unio bhamoensis THEOBALD, Jl. As. Soc. Beng., XLII, 1874, Pt. 2, p. 207, pl. XVII, fig. 1.—?HANLEY and THEOBALD, Conch. Ind., 1876, p. 62, pl. CLV, fig. 2.—VON MARTENS, Arch. für Naturf., 1899, p. 38, pl. V, figs. 2-4.

Parreysia bhamoensis SIMPSON, Syn., 1900, p. 843.

A solid, triangular species. I have before me a right valve of a shell, which agrees almost absolutely with the figure in the Conchologia Indica, but is not quite so strongly corrugated behind. The beak cavity is very deep and compressed, the muscle scars are small and deep and the nacre is brilliant.

PARREYSIA MANDELAYENSIS (Theobald).

Shell decidedly triangular, rather solid, subinflated, beaks and umbonal region much elevated, strongly sculptured with zigzag-radial bars, sometimes with one or two radial rows of tubercles, the sculpture being continued over the whole shell; posterior ridge narrowly rounded, placed close to the lightly curved post-dorsal outline; anterior end obliquely subtruncate above, rounded below; base line rounded; surface having strong, uneven, concentric sculpture; epidermis tawny to greenish, subshining; pseudocardinals subtriangular, not very ragged; anterior muscle scars deep; beak cavities deep; nacre bluish-white.

Length 40, height 31, diam. 21 mm.

Mandelay.

Unio mandelayensis THEOBALD, Jl. As. Soc. Beng., XLII, 1874, p. 208, pl. XVII, fig. 2.—HANLEY and THEOBALD, Conch. Ind., 1876, p. 62, pl. CLIV, fig. 4.

Parreysia bhamoensis, (part), SIMPSON, Syn., 1900, p. 843.

In the Synopsis I placed this in the Synonymy of *P. bhamoensis*, but I am satisfied that this was an error. Since writing that I have seen several shells, which agree fairly well with figures and description of *mandelayensis* and I believe now that it is a good species. The beaks and umbonal region are very high and placed well forward, they are strongly and sometimes tubercularly sculptured; the whole shell is decidedly triangular.

PARREYSIA PERNODULOSA Preston.

"Shell small, ovate, dark brown; both valves sculptured anteriorly with coarse, corrugate ridges, which become more nodulous and irregular in the median and posterior regions; umbones rather large; dorsal margin rapidly sloping anteriorly, slightly sloping posteriorly; ventral margin somewhat rounded; anterior side rather contracted, sharply rounded; posterior side broad, very gently rounded; cardinal teeth very anteriorly situate, in the right valve squarish, bearing two elongate grooves; in the left valve large, jagged, split into three portions, between each of which occur two deep notches, the middle portion, or that between the two notches being by far the smallest; at the base of the anterior portion is situated a smaller, jagged tooth, which is obliquely grooved in the centre; lateral teeth in both valves posteriorly, elongately arched, grooved down the whole length; anterior scars very deep; posterior scars elongate, but not well marked; interior of shell pale bluish, nacreous.

Long. 15.5, lat. 20.5 mm." (Preston).

Type locality, Zayleyman, Upper Burma.

Parreysia pernodulosa PRESTON, Rec. Ind. Mus., VII, 1912, p. 300.

PARREYSIA FEDDENI (Theobald).

Shell obovate, subsolid, subinflated, nearly equilateral; beaks full and high; anterior end considerably narrowed and rounded; posterior end wide, almost evenly rounded, produced a little behind the ligament and at the median line; posterior ridge well developed, narrowly rounded; surface irregularly marked with growth lines; epidermis yellowish-green, with indications of being banded, feebly rayed, shining; teeth rather delicate; pseudocardinals subcompressed, ragged; laterals curved, wide, two in the left valve, the lower wider, and one in the right; muscle scars rather shallow; nacre bluish-white, not shining.

Length 26, height 17, diam. 11 mm.

Penugunga River, Central India.

Unio feddeni Theobald, Jl. As. Soc. Beng., XLII, 1874, p. 208, pl. xvii, fig. 3.

Parreysia feddeni Simpson, Syn., 1900, p. 843.

The original figure and description of this species are not accessible as I write this description, but a specimen is before me from the Morelet collection bearing the name *Unio feddeni* Theobald, from Yunnan. It has the appearance of being young. It is remarkable for its obovate form, being almost evenly rounded behind, and for having very wide laterals and subcompressed pseudocardinals. It was compared with the figure and description of *feddeni* and agrees fairly well with them.

Parreysia daccaensis Preston.

"Shell differing from *P. feddeni* Theobald, in its much larger size, more ponderous form, and more elongately ovate shape, it is much darker in color, being of a dark, blackish-brown instead of the greenish-yellow shade of that species, the shell is much more coarsely, concentrically striate and is also considerably malleated, while *P. feddeni* is almost smooth in texture; the umbones in the present species are, though larger, far less prominent, but the system of hinge teeth is the same.

Long. 47, lat. 76.5, diam. 29 mm." (Preston).

Type locality, Dacca.

Parreysia daccaensis Preston, Rec. Ind. Mus., VII, 1912, p. 300.

Parreysia tavoyensis (Gould).

Shell subtriangular, sometimes sub-obovate, subinflated, subsolid to moderately solid, slightly inequilateral; beaks high and full, strongly sculptured with zigzag-radial bars, this sculpture often extending over the whole disk of the shell; sometimes it is almost wanting and the surface is concentrically furrowed;

posterior ridge well developed, narrowly rounded or subangular; dorsal slope often obliquely truncate, usually covered with strong, subradial folds; epidermis usually dirty bottle-green, sometimes slightly variegated and faintly rayed, at other times it is a lurid, greenish-brown, scarcely shining; hinge line arched; teeth only moderately strong; pseudocardinals somewhat divided, but much less so than in most related species; beak cavities only moderately deep; nacre dull, bluish to flesh-colored, often lurid in the cavities.

Length 52, height 39, diam. 24 mm.
Length 44, height 35, diam. 21 mm.
Burma, India.

Unio tavoyensis GOULD, Pr. Bost. Soc. N. Hist., I, 1843, p. 140. —KUSTER, Conch. Cab. Unio, 1856, p. 166, pl. XLVIII, fig. 2. —REEVE, Conch. Icon., XVI, 1864, pl. XIII, fig. 49.—HANLEY and THEOBALD, Conch. Ind., 1876, p. 62, pl. CLIV, figs. 6, 7.

Margaron (Unio) tavoyensis LEA, Syn., 1870, p. 31.

Parreysia tavoyensis SIMPSON, Syn.., 1900, p. 843.

Unio savoyensis PÆTEL, Conch. Sam., III, 1890, p. 166.

Unio parma BENSON, Sowerby, Conch. Icon., XVI, 1868, pl. XCV, fig. 514.—HANLEY and THEOBALD, Conch. Ind., 1876, p. 61, pl. CLIV, fig. 1.

Close to *corrugata,* but usually more covered with sculpture and having a dirty greenish or brownish epidermis. The specimen represented by figure 7 on plate cliv in the Conchologia Indica is brighter colored than any I have seen. The pseudocardinals are less ragged than in *corrugata* and allied forms.

I am inclined to believe that *Unio parma* Benson is a somewhat elongated form of this, as there is a specimen of *tavoyensis* from Gould in the Lea collection that is much like the figure in the Conchologia Indica.

Var. *triembolus* (Benson).

This seems to me to be a short, pale colored variety of *tavoyensis*, in which the disk is almost free of sculpture. *Unio houngdaranicus* Tapperone-Canefri, of which specimens from

Fea are before me, is much like it, but is a little brighter colored. One of them has considerable zigzag sculpture scattered over the disk.

Burma; India.

Unio triembolus Benson, Jl. As. Soc. Beng., XXXV, 1855, p. 144.—Hanley and Theobald, Conch. Ind., 1876, p. 43, pl. cvii, fig. 2.

Parreysia tavoyensis var. *triembolus* Simpson, Syn., 1900, p. 844.

Unio houngdaranicus Tapperone-Canefri, Ann. Mus. Civ., VII, 1889, p. 341.

Parreysia vulcanus (Hanley).

Shell subtriangular, solid, inequilateral, green throughout except the anterior extremity; strongly plicate or tuberculately corrugated; anterior end somewhat narrowed, rounded; posterior end wider, rounded below, subtruncated obliquely above; base line lightly arcuate; beaks high; hinge strong; pseudocardinals solid, lacerated; anterior muscle scars deep; nacre white, slightly iridescent.

Length 33, height 25 mm.

Burma; Pegu.

Unio vulcanus Hanley, Pr. Zool. Soc. Lond., 1875, p. 606.—Hanley and Theobald, Conch. Ind., 1876, p. 62, pl. clv, fig. 3.

Parreysia vulcana Simpson, Syn., 1900, p. 844.

A very distinct species apparently, having a moderately near relationship to *P. mandelayensis*. It is, however, not so triangular as that species, being somewhat obovate, and its sculpture is more decidedly tuberculate. It is more nearly equilateral than that species.

Parreysia feæ (Tapperone-Canefri).

Shell subtriangular or subrhomboid, rather inflated, subsolid or solid, somewhat inequilateral; beaks high and full, with irregular zigzag-radial sculpture; posterior ridge well developed, narrowly rounded, curved, sometimes partly double, ending in a blunt point or biangulation below the median line;

surface somewhat concentrically sculptured, sometimes having faint zigzag sculpture; epidermis dirty yellowish-green in young shells, brown on old specimens, scarcely shining; pseudocardinals subtriangular, low, but little ragged; laterals remote, curved, not strongly developed, granular; muscle scars well marked; beak cavities only moderately deep; nacre flesh-colored, often luridly blotched in old shells.

Length 54, height 45, dia. 27 mm.

Length 60, height 41, diam. 28 mm.

Burma.

Unio feæ TAPPERONE-CANEFRI, Ann. Mus. Civ. Gen., 2d ser., VII, 1889, p. 340.

Parreysia feæ SIMPSON, Syn., 1900, p. 844.

This species has never been figured, so far as I know. Three shells bearing the name *Unio feæ* Tapperone-Canefri, from Fea himself, taken from the Houngdaran River, Burma, are before me and they show it to be a variable species. One of them is quite rhomboid; the other two are subtriangular. The laterals are not strongly developed and are granular something like those of *P. biesiana*.

PARREYSIA RAJAHENSIS (Lea).

Shell inflated, solid, triangular, slightly inequilateral; beaks full and high, their sculpture not seen; lunule well marked; posterior ridge high, subangular; above this there is a radial furrow ending in a sinus, and the dorsal slope is subtruncated; anterior end angled at its junction with the depressed lunule, obliquely truncate below this, rounded below; base rounded, fullest just behind the middle; surface with decided, concentric growth lines; epidermis brownish-green, slightly banded, shining; hinge line arched; pseudocardinals ragged; anterior scars deep; nacre bluish, silvery and iridescent.

Length 36, height 29, diam. 21 mm.

Calcutta.

Unio rajahensis LEA, Pr. Am. Phil. Soc., II, 1841, p. 30; Tr. Am. Phil. Soc., VIII, 1842, p. 239, pl. XXIII, fig. 53; Obs., III, 1842, p. 77, pl. XXIII, fig. 53.—CHENU, Ill. Conch., 1858, pl. XXVI, figs. 3, 3*a*, 3*b*.

Margaron (Unio) rajahensis LEA, Syn., 1852, p. 25; 1870, p. 38.

Parreysia rajahensis SIMPSON, Syn., 1900, p. 844.

Unio indicus SOWERBY, Conch. Icon., XVI, 1866, pl. XL, fig. 222.—HANLEY and THEOBALD, Conch. Ind., 1876, p. 43, pl. CLII, fig. 1.

Margaron (Unio) indicus LEA, Syn., 1870, p. 31.

I have only seen the type, but it seems to me that the species is very distinct. The almost angular posterior ridge with the rather deep radial groove above it are excellent distinguishing characters.

Group of *Parreysia rugosa*.

Shell rather solid, elliptical to subtrapezoidal; beaks full, with zigzag-radial sculpture and fine corrugations and granules over the surface of the shell.

PARREYSIA RUGOSA (Gmelin).

Shell long elliptical or long rhomboid, subinflated, rather solid, inequilateral; beaks full and high, with strong, zigzag-radial sculpture; posterior ridge rounded; anterior end rounded, sometimes angled above; base line nearly straight; posterior end rounded or obliquely subtruncate above; dorsal outline arcuate; surface with irregular growth lines; epidermis greenish in young shells, brownish in old ones; pseudocardinals solid, much split; laterals straight, two in the left valve and a partly double one in the right; anterior scars deep; posterior scars shallow; nacre salmon, iridescent, thicker in front.

Length of type 42, height 24 mm.

Length of shell in Lea collection 57, height 34, diam. 22 mm.

Coromandel.

Mya rugosa GMELIN, Syst. Nat., 13th ed., 1788, p. 3222.—WOOD, Ind. Test., 1825, p. 12, pl. II, fig. 33*a*; rev. ed., 1856, p. 16, pl. II, fig. 33.

Unio rugosus KUSTER, Conch. Cab. Unio, 1862, p. 290, pl. XCVII, fig. 5.

Parreysia rugosa SIMPSON, Syn., 1900, p. 844.

Gmelin refers to the *Mya corrugata magna*, etc., of Chemnitz in the tenth volume of the Conchylien Cabinet, p. 346, pl CLXX, fig. 1649. This appears to be a young shell with well-preserved beaks, which have strong, zigzag-radial sculpture and a yellowish-green epidermis. There is a shell in the Lea Collection from the Vellaur River in the Coromandel region of India, which is evidently adult and seems to me to be this. The beaks are so eroded that no sculpture is visible and the epidermis is brown, the posterior basal part is slightly produced, but the pseudocardinals are characteristic of *Parreysia* and I have no doubt that it is Gmelin's shell.

PARREYSIA CORBIS (Hanley).

Shell somewhat obovate, subinflated, moderately solid, inequilateral; beaks full and high, with zigzag-radial sculpture; posterior ridge rounded; anterior end narrowed and rounded; base line arcuate, fullest behind the middle; dorsal outline curved; outline of dorsal slope rounded, the posterior end being bluntly pointed a little below the median line; surface nearly smooth, having only faint, concentric sculpture; epidermis greenish or brownish-green, shaded with yellowish, in some specimens having indications of rays; pseudocardinals ragged; laterals curved, remote; beak cavities well impressed; anterior scars deep; nacre rather dull, whitish, yellowish or pale, lurid purplish, thinner behind.

Length 44, height 29, diam. 20 mm.

Length 38, height 25, diam. 16 mm.

Assam.

Unio corbis HANLEY, Biv. Shells, 1856, p. 386, pl. XXIII, fig. 43.—HANLEY and THEOBALD, Conch. Ind., 1876, p. 22, pl. XLV, fig. 10.

Margaron (Unio) corbis LEA, Syn., 1870, p. 50.

Parreysia corbis SIMPSON, Syn., 1900, p. 845.

Three shells are before me, belonging to the National Museum collection from Assam, India, which agree fairly well with Hanley's description and figure and with the figure in the Conchologia Indica. I am not certain that the species belongs to the same group with *P. rugosa*, though they are probably rather nearly related.

PARREYSIA BURMANA (Blanford).

Shell subelliptical, solid, convex, decidedly inequilateral, blackish or fuscous-olive, concentrically plicate striate; disks with oblique, angular, subgranulose sculpture in the middle and behind; umbonal region full and wide; beaks with zigzag-radial sculpture; posterior ridge full, narrowly rounded; anterior end rounded; dorsal outline well arched; basal line nearly straight; posterior end rounded, very slightly produced at or below the median line; pseudocardinals short, somewhat ragged; laterals remote, elevated; nacre salmon to bluish white.

Length 52, height 35, diam. 22 mm.

Length 45, height 32, diam. 20 mm.

Burma.

Unio burmanus BLANFORD, Pr. Zool. Soc. Lond., 1869, p. 449. —VON MARTENS, Arch. für Naturf., 1899, p. 38, pl. V, fig. 5.

Unio birmanus HANLEY and THEOBALD, Conch. Ind., 1876, p. 19, pl. XLII, fig. 1.

Parreysia burmanus SIMPSON, Syn., 1900, p. 845.

Two young shells from Fea, collected in the Upper Irrawady River, are in the National Museum. Their color is yellowish-green, with darker bands. This seems to differ from *P. corbis* in having the dorsal outline much rounded and that of the base nearly straight, and in having a considerable part of the surface sculptured, while *corbis* is smooth.

PARREYSIA SIKKIMENSIS (Lea).

Shell rather short, subrhomboid, subsolid, subinflated, inequilateral; beaks apparently moderately full and elevated, with zigzag-radial sculpture that sometimes extends well on to the disk; posterior ridge double, though sometimes scarcely so, ending in a biangulation near the base of the shell; surface finely, concentrically sculptured; epidermis greenish-brown, scarcely shining; pseudocardinals much split up, with denticles behind them; laterals short, high, remote; anterior scars impressed; nacre white, or bluish, somewhat iridescent.

Length 32, height 21, diam. 14 mm.

Length 30, height 21, diam. 13 mm.

Sikkim; Tulpigorie, India.

Unio sikkimensis LEA, Pr. Ac. N. Sci. Phila., III, 1859, p. 151; Jl. Ac. N. Sci. Phila., IV, 1859, p. 251, pl. XXXIX, fig. 131; Obs., VII, 1860, p. 69, pl. XXXIX, fig. 131.—SOWERBY, Conch. Icon., XVI, 1868, pl. LXXVI, fig. 400.—HANLEY and THEOBALD, Conch. Ind., 1876, p. 6, pl. XI, fig. 4; p. 44, pl. CVII, figs. 6, 7.

Margaron (Unio) sikkimensis LEA, Syn., 1870, p. 64.

Parreysia sikkimensis SIMPSON, Syn., 1900, p. 845.

A small species, of which the type is not in the Lea collection. Four shells, however, are before me, two of them from Sikkim, the other two from Tulpigorie, India, which agree well with Lea's figures and description. The species seems to be smaller than *P. burmana,* the posterior ridge is double, the surface has less zigzag sculpture and the form is rather more rhomboid.

PARREYSIA GOWHATTENSIS (Theobald).

Shell small, short rhomboid, convex, inequilateral, scarcely subsolid; beaks only moderately full and elevated, with very fine, zigzag-radial sculpture, which extends all over the surface and is subangular in places; besides this, the shell is delicately but decidedly, concentrically sculptured; posterior ridge inclined to be double, ending in a feeble biangulation near the base of the shell; epidermis pale yellowish-green back to the posterior ridge, over this and the hinder end of the shell it is green, sometimes faintly rayed; pseudocardinals ragged; anterior scars impressed; nacre bluish, sometimes yellowish in the cavities, iridescent.

Length 24, height 15.5, diam. 10 mm.

Gowhatti, in Assam.

Unio gowhattensis THEOBALD, Jl. As. Soc. Beng., XLII, 1873, p. 208, pl. XVII, fig. 4.

Parreysia gowhattensis SIMPSON, Syn., 1900, p. 845.

Unio gowlattensis PÆTEL, Conch. Sam., III, 1890, p. 154.

Distinguished from the other members of the group by its small size and wonderfully subgranulous sculpture that covers the entire shell, the light anterior and dark posterior portions.

Parreysia annandalei Preston.

"Shell oval, convex, moderately solid, coarsely, concentrically ribbed, covered with a thin, smooth, brownish-olivaceous periostracum; umbones rather small, not prominent; dorsal margin arched; ventral margin considerably rounded; anterior side slightly produced and rather sharply rounded; posterior side very bluntly subrostrate; cardinal teeth two in each valve, somewhat anteriorly situate, rather coarse, corrugated; lateral teeth strong, curved; anterior scars rather small, very deeply excavated; posterior scars also small, ovate, deeply impressed; interior of shell whitish, iridescent.

Long. 29, lat. 41, diam. 20 mm." (Preston).

Type locality, Gowhatty.

Parreysia annandalei Preston, Rec. Ind. Mus., VII, 1912, p. 302.

Parreysia perconvexa Preston.

"Shell ovate, slightly curved, very convex, solid, but much eroded, where intact covered with a dark, blackish brown periostracum; umbones moderately large; dorsal margin sloping in an anterior direction; ventral margin slightly curved posteriorly; anterior side gently rounded; posterior side slightly and very bluntly produced, rounded; cardinal teeth very anteriorly situate, with upper surface multi-ridged and supported in each valve by an enormous column-like callus thickening of the shell; lateral teeth coarse, rather short, curved; anterior muscular scars of great depth; posterior scars subcircular, well impressed; interior of shell very pale, greenish-white.

Long. 37, lat. 55, diam. 33 mm." (Preston).

Type locality, Nangyong Lake.

Parreysia perconvexa Preston, Rec. Ind. Mus., VII, 1912, p. 302.

Parreysia modesta (Heude).

Shell solid, subinflated, somewhat elongated and irregularly obovate or subrhomboid, inequilateral; beaks apparently not elevated; posterior ridge feebly developed, slightly double;

anterior end narrowed, rounded; dorsal outline arched; dorsal slope obliquely rounded; base line straight, sometimes very slightly incurved medially; surface olivaceous-fuscous, shining; pseudocardinals conical, simple; laterals short, obsolete.

Length 60, height 30, diam. 25 mm.

Province of Ngan-Hoei, China.

Unio modestus HEUDE, Conch. Fluv. Nank., II, 1877, pl. XIV, fig. 29.

Unio simpularis HEUDE, Jl. de Conch., XXXII, 1884, p. 20.

Parreysia simpularis SIMPSON, Syn., 1900, p. 845.

I can only guess at the relationship of this form, of which Heude gives only an outline figure and a very meagre Latin description. He states that the shell is compressed but his dimensions (given above) show it to be much inflated. He also states that the beaks are corrugated. It may possibly be a *Pseudodon*, though the general form would indicate that it was related to *P. corbis*.

The name *modestus* having been used previously for a Brazilian *Unio*, Heude afterwards changed his name to *simpularis*. But I can not find that this Brazilian form, which is generally credited to Ferussac, was ever described, hence Heude's first name must stand. It is quite probable that this should form a separate group.

PARREYSIA TRISULCATA (Heude).

Shell small, subtriangular, solid, subinflated, inequilateral; beaks and umbonal region full, having three strong, low, subconcentric sulcations; posterior ridge full, feebly double or rounded; terminating in a faint biangulation; dorsal outline strongly arcuate; base line much more nearly straight, so that the shell is somewhat triangular; epidermis yellowish-fuscous, transversely, minutely striate; pseudocardinals conical, obtuse; laterals short, obsolete; nacre flesh-colored.

Length 30, height 17, diam. 11 mm.

China.

Unio trisulcatus HEUDE, Conch. Fluv. Nank., VIII, 1883, pl. LVII, fig. 108.

Parreysia trisulcata SIMPSON, Syn., 1900, p. 845.

Acuticosta trisulcata HAAS, Conch. Cab., Unio, 1912, pl. 30, fig. 11.

I know nothing whatever of this species and am very doubtful whether it is related to *P. corbis* at all. The three subconcentric ridges on the umbonal region are characters not found in any other species I have placed in *Parreysia* and if they are a part of the beak sculpture they would indicate that this shell belonged in the Exobranchiæ. Heude states, however, that the beaks are eroded. The general form of the shell as indicated by his figure would seem to ally it with the forms I have first described.

Group of *Parreysia leopoldvillensis*.

Shell rounded rhomboid, somewhat inflated, subsolid, with a rounded post-ridge; beaks full, the sculpture strongly and regularly zigzag-radial and extending well over the body of the shell; pseudocardinals heavy, subcompressed, crenate; anterior scars deep.

PARREYSIA LEOPOLDVILLENSIS (Putzeys).

Shell irregularly obovate or subtriangular, subsolid, subinflated, somewhat inequilateral; beaks small but decidedly elevated, sculptured with radiating ridges on the posterior slope and with chevron-shaped markings below them, this sculpture extending over a considerable part of the surface; posterior ridge scarcely developed; dorsal line curved from the upper part of the narrow, rounded anterior end to the hinder end of the small wing; the posterior end is obliquely and somewhat roundly truncated, the truncation ending in a rounded point near the base of the shell; pseudocardinals rather strong, subcompressed, crenulate; laterals lamellar, curved; anterior scars impressed; nacre pearly, bluish, salmon-tinted in the cavaties.

Length 45, height 28-30, diam. 15-19 mm.

Stanley Pool, Leopoldville, Congo.

Unio leopoldvillensis PUTZEYS, Proc. Verb. Soc. Mal. Belg., XXVII, 1898, pl. XXVII, figs. 12, 13.

Parreysia leopoldvillensis SIMPSON, Syn., 1900, p. 846.

I have never seen this shell, which seems from the description and figures to be rather closely related to the species of the group of *P. bakeri*. It is less inflated and does not have a strong posterior ridge, but the zigzag sculpture, ending considerably above the base of the shell, is like that of the species I have placed in that group.

Group of *Parreysia bakeri.*

Shell small, inflated, oval, rounded in front, bluntly pointed behind, inflated at or behind the central base; beaks full, high, sculptured with very strong, zigzag bars, which extend part way over the disk and end rather suddenly, below which the shell is smooth; posterior ridge well developed, rounded; two compressed pseudocardinals and one lateral in the right valve, two pseudocardinals and two laterals in the left valve.

PARREYSIA BAKERI (H. Adams).

Shell transverse ovate, thin, subinflated, inequilateral; anterior end rounded; posterior end dilated, subangulate, strongly, undulately plicate; epidermis olivaceous; beaks subprominent, nodulous at the apices; pseudocardinals small, sulcate; laterals nearly straight, double in the left valve; nacre pearly or silvery, iridescent.

Length 30, height 21, diam. 14 mm.

Lake Albert Nyanza, Central Africa.

Unio bakeri H. ADAMS, Pr. Zool. Soc. Lond., 1866, p. 376.—SMITH, Ann. and Mag., X, 1892, p. 126, pl. XII, fig. 11.—VON MARTENS, Besch. Deuts. Ost-Af., 1897, p. 231, pl. VII, fig. 6.

Parreysia bakeri SIMPSON, Syn., 1900, p. 846.

Adams does not figure his species, but Smith and von Martens do. The figure given by the former is of a young shell in the first or strongly zizzag radial stage of growth and shows an obovate specimen. That of von Martens is taken from an adult specimen and shows both the earlier zigzag-radial and later the nearly smooth, concentric sculpture characteristic of this group. His figure shows a somewhat rhomboid shell and he gives as its greatest length 43 millimeters. The early sculpture of this form is excessively strong. Adams' type was probably a young specimen.

PARREYSIA STUHLMANNI (von Martens).

Shell irregularly elliptical, somewhat inflated, shining, brown, inequilateral; beaks very high, with strong zigzag-radial sculpture, which extends to some distance out on the disk, the outer part of the shell being nearly smooth; anterior end rounded; base line curved; hinge line lightly curved, angled at the hinder end of the ligament; dorsal slope obliquely truncate; posterior ridge rather high, ending in a rounded point below the median line; nacre silvery white.

Length 43, height 26, diam. 14 mm.

Albert Edward Lake, Central Africa.

Unio stuhlmanni VON MARTENS, Besch. Deuts. Ost-Af., 1897, p. 231, pl. VII, fig. 13.

Parreysia stuhlmanni SIMPSON, Syn., 1900, p. 846.

In outline this shell resembles certain specimens of *Plagiola donaciformis*. The characteristic beak and earlier sculpture does not appear to come very far out over the surface.

PARREYSIA HAUTTECŒURI (Bourguignat).

Shell irregularly oval, subinflated, rather solid, inequilateral; beaks moderately full and high, with strong, zigzag sculpture, which extends over the shell nearly to its border; beyond this the border is concentrically striate; anterior end rounded; base line curved, with a tendency to be slightly produced in the middle; outline of dorsal slope arcuate; posterior ridge full, narrowly rounded, placed near to the upper edge of the shell, ending in a rounded point a little below the median line; epidermis uniform brown-olive; nacre bluish; pseudocardinals compressed, triangular, elevated; laterals thin.

Length 36, height 22, diam. 16 mm.

Lake Victoria Nyanza, Central Africa.

Unio hauttecœuri BOURGUIGNAT, Moll. Ny. Ouk., 1883, p. 5, figs. 1-3.—VON MARTENS, Besch. Deuts. Ost-Af., 1897, p. 232, pl. I, fig. 23; pl. VII, fig. 3.

Nodularia hauttecœuri SIMPSON, Syn., 1900, p. 846.

Unio grantianus BOURGUIGNAT, Moll. Ny. Ouk., 1883, p. 14.

Differs from *P. stuhlmani* in having less elevated beaks, in being nearly covered with strong zigzagged sculpture and having the dorsal slope rounded instead of angled.

Var. *edwardsiana* Bourguignat.

This may be a form of the above. The surface is sculptured almost out to the edge of the shell. It is a little more inflated in proportion to its height than typical shells are.

Length 25, height 14, diam. 12 mm.

Lake Victoria Nyanza.

Unio edwardsianus BOURGUIGNAT, Moll. Ny. Ouk., 1883, p. 12, figs. 7, 9.

Nodularia hauttecœuri var. *edwardsiana* SIMPSON, Syn., 1900, p. 846.

PAREYSSIA POSTUMA (Rochebrune).

Shell subelliptical or subrhomboid, convex or moderately inflated, inequilateral, subsolid; beaks moderately elevated, covered with strong zigzag-radial sculpture that extends almost to the border of the shell, the border being concentrically sculptured; anterior end rounded, slightly cut away below; base almost evenly rounded; dorsal outline lightly arcuate; posterior slope obliquely subtruncate; posterior ridge faintly double, ending in a feeble biangulation at and below the median line; epidermis yellowish-olive or chestnut-olive; nacre white or salmon-tinted; teeth subcompressed.

Length 23, height 15.5, diam. 11.5 mm.

Length 21, height 15, diam. 8 mm.

Lake Victoria Nyanza.

Unio duponti BOURGUIGNAT, Moll. Ny. Ouk., 1883, p. 8, figs. 10-12.

Parreysia duponti SIMPSON, Syn., 1900, p. 846.

Unio bakeri VON MARTENS, Sitzber. Ges. Nat. Fr., 1879, p. 104.

Unio grandidieri BOURGUIGNAT, Moll. Ny. Ouk., 1883, p. 7, figs. 4-6.

Unio postumus ROCHEBRUNE, Bull. Mus. Hist. Nat., 1904, p. 258.

The only difference I can see, that amounts to anything, between this and the *Unio grandidieri* of Bourguignat is that the latter is a little more inflated in proportion to its height. The outlines of both are alike, rhomboid elliptical and the sculpture does not seem to differ.

In the Synopsis this species was referred to *U. duponti* Roche. But that author claims that the two species are quite distinct and (l. c.) has proposed a new name for the *duponti* Bgt.

PARREYSIA RUELLANI (Bourguignat).

Shell subsolid, elliptic rhomboid, inflated, inequilateral; beaks slightly elevated, with strong, zigzag sculpture, which does not extend far out on the disk, the rest of the surface is concentrically sculptured and shows traces of radial sculpture; epidermis yellowish-green; anterior end rounded, slightly cut away below; dorsal and basal outlines lightly arcuate; outline of dorsal slope obliquely rounded, subangulate just behind the ligament; teeth somewhat compressed; nacre white.

Length 35, height 23, diam. 16.5 mm.

Lake Victoria Nyanza.

Unio ruellani BOURGUIGNAT, Moll. Ny. Ouk., 1883, p. 10, figs. 16-18.

Parreysia ruellani SIMPSON, Syn., 1900, p. 846.

In form this is much like *P. hauttecœuri,* but it is rather more inflated, the strong, umbonal, zigzag sculpture does not extend far out on the disk and the remainder of the shell shows traces of radial sculpture.

Var. *bayoni* (Germain).

"Shell more elongated-oval, proportionally less globose; anterior end more developed on account of the less anterior position of the beaks; epidermis differently colored. The hinge is the same as in typical *ruellani,* except that the cardinal teeth are slightly more elongated, owing to the greater development of the anterior part of the shell. Shell not very thick, solid, beaks much eroded; epidermis of a clear yellow-chestnut and quite brilliant; lines of growth irregular. Nacre bluish and iridescent.

Length 33-35, height 21-24, diam. 15-14 mm." (Germain).

Type locality, Bugala Island, Sesse Archipelago, Victoria-Nyanza.

Unio ruellani var. *bayoni* GERMAIN, Bull. Mus. Hist. Nat., 1909, p. 275, pl. III, fig. 36.

PARREYSIA MULTICOLOR (von Martens).

Shell oval rhomboid, moderately solid, inflated, inequilateral; beaks rather full and high, with zigzag sculpture, which does not extend far out over the disk; anterior end rounded, cut away somewhat below; dorsal and basal outlines arcuate; dorsal slope obliquely subtruncate; posterior ridge full, rounded, ending in a rounded point at the base; epidermis shining, dirty greenish-yellow or brownish-green with many narrow, grass-green rays; pseudocardinals thick, lamelliform with a few strong furrows and notches; laterals arched; nacre rose or purplish-red.

Lake Victoria Nyanza.

Unio multicolor VON MARTENS, Besch. Deuts. Ost-Af., 1897, p. 236, pl. VII, fig. 4.

Parreysia multicolor SIMPSON, Syn., 1900, p. 847.

This species may be distinguished by the fine, bright rays on the smoother part of the shell and the rich, purplish rose-colored nacre.

PARREYSIA NGESIANA (von Martens).

Shell subsolid, subinflated, rhomboid oval, inequilateral; beaks full and high, with strong, zigzag sculpture, which extends about half way over the disk with two radial rows of tubercles, the rest of the surface nearly smooth; anterior end narrowly rounded; base arcuate, full at the middle; hinge line curved; dorsal slope obliquely truncate; posterior ridge rather high, narrowly rounded, ending just below the median line in a blunt point; epidermis light brown; nacre silvery with bluish or rose-red tints; pseudocardinals lamelliform, notched; laterals moderately arched.

Length 33-35.5, height 24-24.5, diam. 16-17 mm.

Lake Albert Edward Nyanza.

Unio ngesianus VON MARTENS, Besch. Deuts. Ost-Af., 1897, p. 234, pl. VII, fig. 7.

Parreysia ngesianus SIMPSON, Syn., 1900, p. 847.

This species has two radial rows of tubercles, which sometimes become somewhat V-shaped, that radiate from the beaks. The base is slightly produced in the center.

The following unfigured species are placed in this group by von Martens:

Unio billotianus CHARMES, Bull. Soc. Mal. Fr., II, 1885, p. 170, Bagamoyo, Central Africa.

Unio euphymus CHARMES, Bull. Soc. Mal. Fr., II, 1885, p. 171, Bagamoyo.

Unio dumesleanus CHARMES, Bull. Soc. Mal. Fr., II, 1885, p. 168, Bagamoyo.

Group of *Parreysia fabagina*.

Shell very small and solid, inflated, compressed on the sides, rhomboid, with a high, sharp posterior ridge and high beaks, having zigzag-radial sculpture sometimes extended over the disk, the posterior slope furnished with upcurved plications; pseudocardinals heavy, torn, one in the right valve, two in the left; muscular impressions circular, the anterior very deep.

PARREYSIA FABAGINA (Deshayes).

Shell very solid, small, inflated, rhomboid, inequilateral; beaks full and elevated, with irregular zigzag-radial sculpture; posterior ridge high, angled, rather close to the edge of the shell, curved, ending in a sharp point near the base of the shell; anterior end rounded; base line lightly arcuate; dorsal outline arched; dorsal slope obliquely subtruncate, there being a low angle where it joins the dorsal part of the shell; epidermis fuscous-green; pseudocardinals thick; laterals strong greatly curved; muscle scars small, the anterior ones deep, the posterior ones semilunar; nacre silvery.

Length 17, height 12, diam. 11 mm.

Mekong River, Cambodia.

Unio fabagina DESHAYES, Nouv. Arch. de Mus., X, 1874, p. 128, pl. VII, figs. 4-6.

Parreysia fabagina SIMPSON, Syn., 1900, p. 847.

Unionella fabagina HAAS, Conch. Cab., Unio, 1912, pl. 31, fig. 8.

An exceedingly solid, small species with strongly arched dorsal outline, high, sharp posterior ridge and curved laterals.

Haas has recently, (Nachr. Deutsch. Mal. Ges., 1913, p. 37), made this species the type of a new genus, *Unionella*.

PARREYSIA BROTI (Deshayes).

Shell small, solid, inflated, rhomboid, inequilateral; beaks full and high; below them there are three strong, low V-shaped ridges, and on the dorsal slope there are oblique wrinkles; posterior ridge high and decidedly angled, slightly arched; anterior end narrow, rounded; dorsal outline strongly arched from the anterior end to the point at the posterior base; base line nearly straight; epidermis yellowish-green, darker on the ridges and border; pseudocardinals solid; laterals heavy, but slightly curved; muscle scars small, deep; nacre silvery.

Length 15, height 11, diam. 9 mm.

Mekong River, Cambodia.

Unio broti DESHAYES, Nouv. Arch. de Mus., X, 1874, p. 129, pl. VII, figs. 1-3.

Parreysia broti SIMPSON, Syn., 1900, p. 847.

Unionella broti HAAS, Conch. Cab., Unio, 1912, pl. 31, fig. 9.

If the specimen, which Deshayes has described, is adult this is probably the smallest Naiad known. It is characterized by the three very strong V-shaped bars across the disk; it has shorter, heavier, less curved laterals than *fabagina*.

Group of *Parreysia nyassaensis*.

Shell small, solid, inflated, triangular to rhomboid, the base straight or even a little arcuate, but sometimes having a slight fullness behind the central part, a high, well-defined posterior ridge ends at the post-base and is sometimes slightly double; posterior slope abrupt; beaks high, with zigzag-radial sculpture, the bars approaching and often coalescing behind the center of the disk, the whole shell frequently corrugate sculptured; epidermis greenish, often slightly rayed; teeth solid, much like those of typical *Parreysia;* nacre white or bluish, sometimes microscopically, granularly radiate outside the pallial line; beak cavaties not deep; anterior scars distinct.

Animal unknown.

Parreysia nyassaensis (Lea).

Shell rhomboid, solid, subinflated, inequilateral; beaks high, full, with strong, zigzag sculpture, which extends over the disk nearly or quite to its outer edge, becoming subnodulous in places, plicate on the dorsal slope; there being also a pattern of irregular, concentric ridges and sometimes feeble radiating furrows; anterior end rounded; base straight or lightly curved; hinge line lightly arched, angled where it joins the obliquely subtruncate dorsal slope; posterior ridge high, subangular; epidermis ashy to greenish, sometimes feebly banded and rayed, subshining; hinge solid; pseudocardinals much split up; laterals more or less double in each valve; anterior scars impressed; nacre whitish or flesh-colored.

Length 33, height 23, diam. 15 mm.

Length 30, height 22.5, diam. 15 mm.

Lake Nyassa, Central Africa.

Unio nyassaensis Lea, Pr. Ac. N. Sci. Phila., VIII, 1864, p. 108; Jl. Ac. N. Sci. Phila., VI, 1866, p. 33, pl. xii, fig. 32; Obs., XI, 1867, p. 37, pl. xii, fig. 32.—Smith, Pr. Zool. Soc. Lond., 1881, p. 298, pl. xxxiv, fig. 34.

Margaron (Unio) nyassaensis Lea, Syn., 1870, p. 30.

Parreysia nyassaensis Simpson, Syn., 1900, p. 848.

Unio nyassæ Sowerby, Conch. Icon., XVI, 1868, pl. xli, figs. 224, 224*a*, 224*b*.

Unio nyassanus Bourguignat, Bull. Soc. Mal. Fr., VI, 1889, p. 38.

Unio hermosus Bourguignat, Bull. Soc. Mal. Fr., VI, 1889, p. 38.

The above measurements are first from the type and the second from a shell belonging to the Morelet collection.

PARREYSIA KIRKII (Lea).

Shell short, subtriangular, subinflated, solid; beaks very high, full, their sculpture consisting of zigzag, subnodulous ridges; this sculpture reappears feebly in various parts of the disk, the posterior slope and upper anterior end being plicate; beside this there are irregular, concentric ridges and feeble radial grooves on the anterior end; posterior ridge high, subangular, with one or two faint ridges above it; lunule distinct, narrow; anterior end narrowly rounded below, obliquely truncate above; base line nearly straight; outline of dorsal slope obliquely rounded from the beaks to the rather sharp basal point; epidermis greenish, feebly rayed, with two or more dark rays on the dorsal slope; hinge strong, arched; pseudocardinals very ragged; laterals heavy, short, treble in the left valve, double in the right; muscle scars impressed; nacre bluish-white, thicker in front.

Length 32.5, height 28, diam. 16 mm.

Lake Nyassa.

Unio kirkii LEA, Pr. Ac. N. Sci. Phila., 1864, p. 108; Jl. Ac. N. Sci. Phila., VI, 1866, p. 32, pl. XII, fig. 30; Obs., XI, 1867, p. 36, pl. XII, fig. 30.

Margaron (Unio) kirkii LEA, Syn., 1870, p. 30.

Parreysia kirkii SIMPSON, Syn., 1900, p. 848.

Close to *nyassaensis* but higher in proportion to length, more triangular, smoother and having a greener epidermis. I have only seen the type.

PARREYSIA UJIJIENSIS (Bourguignat).

Shell ovate rhomboid or ovate triangular, subinflated, inequilateral; beaks high and full, rather sharp; anterior end rounded and very slightly truncated in the middle; base line evenly curved; dorsal outline high at the beaks, arched; posterior end slopingly truncate, subangulate where it joins the dorsal part; posterior ridge full, subangulate, ending in a point a little above the basal line; surface with slight, concentric sculpture with zigzag or wrinkled sculpture above on the anterior end and on the dorsal slope.

Length 29, height 20 mm.

Lake Tanganyika.

Unio nyassaensis var. SMITH, Pr. Zool. Soc. Lond., 1881, p. 298, pl. XXXIV, fig. 34.

Grandidieria ujijiensis BOURGUIGNAT, Bull. Soc. Mal. Fr., II, 1885, p. 7.

Parreysia ujijiensis SIMPSON, Syn., 1900, p. 848.

Mr. Smith does not give a description of this form, which he figured in the Proceeding of the Zoological Society and referred to *Unio nyassaensis* Lea, as a variety. There is some little confusion about it, as he refers to fig. 34*b* on pl. XXXIV, and there is no such number. His 34*a* seems to be typical *nyassaensis* and the 34 a different species, being triangular ovate and smoother than *nyassaensis*. Bourguignat suggested the name *ujijiensis* for this species, but his account of the shell is not accessible as I write. I can not therefore give any account of the beak sculpture, nacre, solidity or diameter of this form.

PARREYSIA AFERULA (Lea).

Shell rhomboid, solid, convex, inequilateral; beaks neither very full nor high, with strong, zigzag sculpture and corrugations, which extend over the entire surface of the disks; posterior ridge full, feebly double, ending in a faint biangulation at the base of the shell; anterior end rounded; base line almost straight; hinge line lightly arched, ending in an angle where it joins the obliquely truncate dorsal slope; epidermis dirty ash colored, not shining; hinge solid; pseudocardinals much split; laterals double in each valve; muscle scars impressed; nacre bluish-white.

Length 29, height 20, diam. 12.5 mm.

Lake Nyassa.

Unio aferula LEA, Pr. Ac. N. Sci. Phila., VIII, 1864, p. 109.

Unio aferulus LEA, Jl. Ac. N. Sci. Phila., VI, 1886, p. 34, pl. XIII, fig. 34; Obs., XI, 1867, p. 38, pl. XIII, fig. 34.

Margaron (Unio) aferulus LEA, Syn., 1870, p. 30.

Parreysia aferula SIMPSON, Syn., 1900, p. 848.

It is quite likely that this is the same as Lea's *Unio nyassaensis,* but I have only seen a single shell, the type, and do not feel like uniting it without more evidence. This may be a young or not fully developed shell. It is less inflated, more strongly and completely sculptured and duller colored than *nyassaensis*. In the right valve there is a sort of triangular pit in the hinge plate behind the pseudocardinals, which is not present in the shells of *nyassaensis* I have seen.

PAREYSSIA MUTELÆFORMIS (Germain).

"Shell small, very elongate rectilinear in shape; rather solid, slightly inflated; dorsal and ventral margins nearly parallel; dorsal margin straight; ventral margin nearly straight, slightly subsinuous in the center and curved upwards towards the posterior end; anterior end rather short, well rounded; posterior part elongated horizontally, almost three times as long as the anterior, keeping the same height as far as the postero-dorsal angle, then narrowing, especially above, to a sharp posterior end; beaks rather anterior, (but very noticeably less than in *Unio monceti* Bourguignat), somewhat inflated, compressed laterally; dorsal crest well marked; in the right valve a double cardinal and two, very long, rather low laterals; in the left valve, one, very high, subquadrangular, distinctly crenulate cardinal and one very long, rather low lateral; anterior muscular impressions deep, posterior superficial. Epidermis yellowish-chestnut or ochreous, sometimes very dark, somewhat worn towards the beaks; lines of growth quite delicate, regular, stronger posteriorly; nacre clear Prussian blue, quite iridescent.

Length 24-26, height 9-10, diam. 5 mm." (Germain).

Type locality, Lake Tchad.

Unio mutelæformis GERMAIN, Mem. Soc. Zool. Fr., XIX, 1906, p. 336; l'Afrique Cent. Fr., 1907, p. 540, pl. lith. figs. 3, 4.

"This species can be compared only with *Unio monceti* Bourguignat, but is distinguished by its smooth surface; its much more elongated form, though the posterior part is not. as in typical *monceti,* three times as long as the anterior, as the anterior end of *monceti* is remarkably short, very round, with the beaks placed very anteriorly; by the much less prominent beaks and much more compressed form."

Var. *chariensis* (Germain).

"This shell differs from the type by its much shorter form, being elliptic-oval; by its dorsal margin slightly ascending and a little subconvex; by its ventral margin, not straight, but very notably and regularly convex; by the higher posterior region by reason of the greater divergence of the dorsal and ventral margins, so that the greatest height is not uniform with that through the beaks, as in the type, but is in the posterior region; by the two quite pronounced dorsal angles; etc." (Germain).

Type locality, La Mamoun, Senoussi country.

Unio mutelæformis var. *chariensis* GERMAIN, l'Afrique Cent. Fr., 1907, p. 541.

"In this little shell, the beaks are much less prominent, the ligament is less strong, and very short; the epidermis of a pale yellowish-red, with fine, close and regular lines of growth; the nacre is of a very iridescent, brilliant rose-salmon color."

PARREYSIA HYPSIPRIMNUS (von Martens).

Shell trapezoid or subrhomboid, solid, inflated, somewhat inequilateral; beaks moderately full and high; posterior ridge full, rounded, ending in a blunt point near the base; anterior end somewhat narrowed, rounded; base nearly straight; dorsal outline slightly sinuous, arched from the beaks to the end of the ligament; posterior end obliquely truncate; surface covered with peculiar, strong, wavy, concentric sculpture; epidermis dirty brown; teeth rather strong; laterals curved; nacre whitish.

Length 33, height 23, diam. 16.5 mm.

Lake Nyassa.

Unio hypsiprimnus VON MARTENS, Besch. Deuts. Ost-Af., 1897, p. 230, pl. VII, fig. 1.—GERMAIN, Bull. Mus. Hist. Nat., 1906, p. 302, figs. 8-16.

Parreysia hypsiprimnus SIMPSON, Syn., 1900, p. 849.

A peculiar species, of which the type is very badly eroded. The sculpture consists of wavy or somewhat ragged, concentric ridges, differing from that of any allied form that I am acquainted with.

Group of *Parreysia molleuri*.

Shell subquadrate, solid, inflated, rounded in front, truncated behind, with high beaks, the sculpture of which was not observed, and a strong, sharp, curved posterior ridge; surface concentrically grooved; pseudocardinals thick, short, cut up with vertical grooves; laterals curved; nacre white.

PARREYSIA MOLLEURI (Morlet).

Shell subquadrate, solid, scarcely inflated, inequilateral; dorsal outline very strongly arched throwing the rugose beaks well up; anterior end a little narrowed, rounded; base line nearly straight; posterior end almost squarely truncated; posterior ridge high, curved, angulate, ending in a blunt point at the base of the shell; surface covered with strong, concentric striæ; epidermis brown-green; pseudocardinals small, thick, short, ragged; laterals much curved; nacre white.

Length 25, height 21, diam. 14 mm.

Valley of the Mekong River.

Unio molleuri MORLET, Jl. de Conch., XXXIX, 1891, p. 242, pl. VII, fig. 4.—HAAS, Conch. Cab., Unio, 1912, pl. 31, fig. 7.

Parreysia molleuri SIMPSON, Syn., 1900, p. 849.

A peculiar form, somewhat quadrate in outline, strongly arched on the entire dorsal region and almost squarely truncate behind.

Haas, (l. c.), considers this a synonym of *P. fabagina*.

Subgenus DIAURORA Cockerell, 1903.

Aurora SIMPSON, Syn., 1900, p. 849.

Diaurora COCKERELL, Naut., XVI, 1903, p. 118.

Shell small, ovate, subinflated, pointed behind, rather solid, with high, small beaks and strong, corrugated sculpture, which extends over half the disk in somewhat lachrymous, zigzag ridges and nodules, the outer part of the disk apparently having one or more strong, concentric ridges, the posterior slope being radiately ridged and nodulous; epidermis fulvous, beautifully and delicately green radiated; pseudocardinals conical, truncate, striate; laterals lamellar; nacre orange.

Type, *Unio auroreus* Heude.

PARREYSIA AURORÉA (Heude).

Shell almost evenly elliptical or very slightly rhomboid, solid, scarcely inflated, inequilateral; beaks only moderately high, small, deeply corrugated, apparently by zigzag ridges; posterior ridge full, narrowly rounded, ending in a blunt point below the median line; anterior end rounded; dorsal and basal outlines almost evenly curved; dorsal slope obliquely subtruncate; surface with strong, subradial, tear-like nodules on its earlier growth and, apparently, about three strong, concentric ridges on the later growth; posterior slope with radial, nodular sculpture; epidermis fuscous, rayed with green; pseudocardinals short, much cut up; muscle scars impressed; nacre orange.

Length 34, height 21, diam. 12 mm.

China.

Unio auroreus HEUDE, Conch. Fluv. Nank., VIII, 1883, pl. LVII, fig. 106.

Parreysia aurorea SIMPSON, Syn., 1900, p. 849.

Heude's description is very brief and of little value, and as in several other cases the measurements given are manifestly wrong. This must be an attractive species having an almost evenly elliptical form, decided radial, lachrymose sculpture and orange nacre.

Subgenus PSEUDOBAPHIA Simpson, 1900.

Pseudobaphia SIMPSON, Syn., 1900, p. 849.

Shell large, oval, inflated, gaping in front and behind, rather solid, with full beaks, the beak sculpture not seen, posterior part distinctly biangular; ligament large; epidermis smooth, brownish, somewhat rayed, right valve with a large, irregular pseudocardinal in front of the beak, with a pit in front of it; behind it on the hinge are numerous denticles, and at some distance behind two very faint laterals; left valve with two large pseudocardinals, one behind the other, and two remote, blurred laterals; two upper, anterior muscle scars united, very deep; posterior scars united, the lower long and oblique; beak cavities very large, deep; nacre flesh-colored, scarcely nacreous.

Animal unknown.

Type, *Unio biesianus* Heude.

PARREYSIA BIESIANA (Heude).

Shell large, rather solid, inflated, subrhomboid, somewhat equilateral; beaks very full and high, corrugated; ligament large, brown; posterior ridge more or less double, ending in a biangulation at and below the median line, the region above it obliquely truncate; epidermis fuscous-olivaceous, slightly rayed when young; surface with irregular, concentric sculpture anteriorly and posteriorly nearly smooth and shining medially; pseudocardinals strong, stumpy, slightly roughened, showing behind them numerous nodules; laterals feeble, in old shells almost wanting; anterior scars deep in their hinder portion; posterior scars large; beak cavities deep, compressed; nacre dirty white or flesh-colored.

Length 106, height 76, diam. 52 mm.

China.

Unio biesianus HEUDE, Conch. Fluv. Nank., II, 1877, pl. XIV, fig. 30.

Parreysia biesiana SIMPSON, Syn., 1900, p. 850.

Pseudobaphia biesiana HAAS, Con. Cab., Unio, 1910, pl. XI, fig. 1.

A large inflated, strong species with a rhomboid form being slightly cut away at the lower part of the anterior end. The anterior and posterior ends gape slightly. The laterals are feeble, but between them and the pseudocardinals there are a number of small tubercles.

Subgenus ACUTICOSTA Simpson, 1900.

Acuticosta SIMPSON, Syn., 1900, p. 850.

Shell pointed behind, produced at the center of the base, inflated, solid, with a sharp, pinched-up, but vanishing posterior ridge, beaks full, the sculpture strong, zigzag-radial; epidermis smooth, rayed; pseudocardinals somewhat compressed, vertically ridged, ragged; laterals well developed, strongly obliquely ridged and granular.

Type, *Unio chinensis* Lea.

PARREYSIA CHINENSIS (Lea).

Shell irregularly elliptical or ovate, somewhat inflated, rather solid, inequilateral; beaks full and high, sculptured with very strong, often subnodulous, zigzag sculpture, which extends well out over the umbonal region; posterior ridge not greatly elevated, but usually sharply angled above, ending in a point at or a little below the median line; there is also a low, ill-defined, radial ridge about on the middle of the disk, the base of the shell being quite full where it ends; lunule large; anterior end rounded; dorsal slope obliquely subtruncate; surface nearly smooth or with irregular, concentric sulcations; epidermis ashy-green or yellowish-green with olive-green rays; pseudocardinals subcompressed, somewhat ragged; laterals remote, elevated; beak cavaties moderately deep; anterior scars impressed; posterior scars shallow; nacre bluish-white, thicker in front.

Length 47, height 31, diam. 22 mm.

Length 40, height 29, diam. 21 mm.

China.

Unio chinensis LEA, Pr. Ac. Nat. Sci. Phila., XII, 1868, p. 150; Jl. Ac. Nat. Sci. Phila., VI, 1868, p. 325, pl. LIII, fig. 138; Obs., XII, 1869, p. 85, pl. LIII, fig. 138.

Margaron (Unio) chinensis LEA, Syn., 1870, p. 30.

Parreysia chinensis SIMPSON, Syn., 1900, p. 850.

Acuticosta chinensis HAAS, Conch. Cab., Unio, 1912, pl. 30, figs. 1-3, 6-7.

The type of this is in the collection of Yale College, according to Dr. Lea, but I have before me three shells of what is undoubtedly this species. They vary a little in form, coloring and the degree of umbonal sculpture. One of them is not very strongly sculptured on the beaks.

Var. *squammosa* (Heude).

Most of the anterior part of this shell is covered with squamose ridges. Heude merely figures the form and gives no details.

China.

Unio sinensis var. *squammosus* HEUDE, Conch. Fluv. Nank., VIII, 1883, pl. LVIII, fig. 113.

Parreysia chinensis var. *squammosus* SIMPSON, Syn., 1900, p. 850.

Acuticosta chinensis var. *squammosa* HAAS, Conch. Cab., Unio, 1912, pl. 30, fig. 5.

Var. *lævis* (Heude).

Shell large, nearly or quite destitute of sculpture, with broad, dark rays.

China.

Unio sinensis var. *lævis* HEUDE, Conch. Fluv. Nank., VIII, 1883, pl. LIX, fig. 116.

Parreysia chinensis var. *lævis* SIMPSON, Syn., 1900, p. 850.

Acuticosta chinensis var. *lævis* HAAS, Conch. Cab., Unio, 1912, pl. 30, fig. 4.

PARREYSIA RETIARIA (Heude).

Shell rather small, inflated, solid, somewhat inequilateral; beaks full and high, turned forward; anterior end rounded; base line nearly straight; outline of dorsal slope obliquely rounded; posterior ridge full, narrowly rounded, ending in a feeble biangulation almost at the base of the shell; in front of the posterior ridge there is a wide, radial, somewhat depressed space; epidermis fuscous horn-color, slightly rayed; pseudocardinals solid, split up; nacre amethyst-rose.

Length 22, height 15, diam. 10 mm.

Streams of Ning-kouo fou and of Tche-tcheou fou, China.

Unio retiarius HEUDE, Conch. Fluv. Nank., VIII, 1883, p. LVII, fig. 107.

Parreysia retiaria SIMPSON, Syn., 1900, p. 850.

Acuticosta retiaria HAAS, Conch. Cab., Unio, pl. 30, fig. 12.

A fine, small species, which probably is related to *P. chinensis*. Its most conspicuous character is the wide, radial, depressed area in front of the posterior ridge.

SPECIES INCERTÆ SEDIS

PARREYSSIA ALLUAUDI Dautzenberg.

"Shell very thin, shining, elongate-oval, rounded in front, truncate and rostrate behind. Ventral margin convex and projecting in the middle. Beaks inflated, quite prominent. Surface sculptured in the umbonal region with oblique, zigzag folds, which extend more or less over the whole of the disk.

Nacre very shining. Anterior muscular impressions round, posterior elongated, rather faint. Hinge very weak. In the right valve, two, weak, elongated cardinals and a single lateral equally weak and elongated. In the left valve one cardinal and two laterals.

Epidermis bluish-green with metallic reflections, ornamented with concentric zones and rays of yellow. Nacre very iridescent.

Length 27, height 16, diam. 11 mm." (Dautzenberg).

Type locality, Bay of Kavirondo, Victoria-Nyanza.

Unio (*Parreyssia*) *alluaudi* DAUTZENBERG, Jl. de Conch., LVI, 1908, p. 26, pl. II, figs. 13, 14, 15, 16.

"Although a certain number of species of *Unio* are known from Lake Victoria, we have not been able to refer to any one of them, the one here described. It is characterized by its thin, very brilliant shell with metallic reflections, weak hinge, elongate form, attenuate and rostrate at the posterior end and by the convex, ventral margin, projecting in the middle.

The sculpture is very variable in *Unio alluaudi*: sometimes the zigzag folds appear only in the umbonal region; but they frequently extend over the whole surface. The coloration is equally variable, for we have seen examples without rays and of a uniform yellow."

PAREYSSIA MWERUENSIS (E. A. Smith).

"Shell small, inequilateral, moderately thin, narrowly gaping at both ends, rounded in front, narrower and produced posteriorly, covered with a brownish-olive periostracum, sometimes painted posteriorly with radiating green lines, smooth but sculptured with lines of growth and more or less corrugated towards the umbones; umbones eroded, placed well forward; nacre white, pearly, iridescent; cardinal teeth rugose, laterals thin, elongated; anterior cicatrix moderately deep, posterior light, not impressed.

Length 26, height 15, diam. 10.5 mm." (Smith).

Type locality, Lake Mweru.

Unio mweruensis E. A. SMITH, Pr. Mal. Soc. London, VIII, 1908, p. 13, text-figs.

"This species varies considerably in form and sculpture. Some specimens are much longer than others, and the amount of corrugation towards the umbones varies considerably. Some examples are almost entirely smooth, whereas occasionally the wrinkling may extend over two-thirds of the surface. The valves are white beneath an olive-brown periostracum, which almost invariably exhibits one or more green rays down the hinder slope. There is in most specimens a kind of lunule in front of the umbones, which varies much in shape, being quite broad and diamond-shaped in some shells and quite narrow and linear in others. An elongate example is 29 mm. in length and 14 in height. A shorter is 20.5 long and 12.75 high."

PAREYSSIA HUNANENSIS Haas.

"Shell very inequilateral, solid, thick. Anterior end very short, semi-circular; ventral margin slightly convex or angulated, posterior end long, biangulate. Beaks situated at 31-100 of the total length, much swollen, incurved; beak sculpture consisting of two, radial, strong ribs, which unite at the apex. The anterior extends in the direction of the deepest point of the ventral margin, but does not reach it; it is tuberculate and may be broken up into a series of distinct tubercles; the posterior extends to the lower angle of the posterior end, where it becomes almost flat and is tuberculate only towards the beaks. The anterior part of the beaks shows weak, slightly raised, radial, somewhat undulating striæ. Ligament short. Dorsal slope low, oblique, with a faint line that extends from the beak to the upper angle of the posterior point. Hinge strong, cardinal tooth of the left valve divided by a rectangular, deep groove, jagged, striate, compressed, between the cardinal and laterals, which meet at a decided angle, there is a long interval; laterals short, strong; the cardinal teeth make an angle of about 30° and the laterals one of 15° with the axis of the shell. The anterior muscular impression deep, funnel-shaped, the posterior not. Nacre of a magnificent bluish-white. Epidermis chestnut-brown with yellowish-brown rays, mostly worn off on the umbones.

Length 36, height 26, diam. 19 mm." (Haas).

Type locality, Hubei, Hunan, Central China.

Pareyssia hunanensis Haas, Nachr. Deutsch. Mal. Ges., 1910, p. 97; Conch. Cab., Unio, 1912, pl. 30, fig. 9.

Genus PTYCHORHYNCHUS Simpson, 1900.

Ptychorhynchus Simpson, Syn., 1900, p. 850.

Shell elongate, elliptical, round in front, pointed behind, the point being midway of the height of the shell, solid, slightly inflated, with a faint posterior ridge; beaks rather low, sculpture not seen; the posterior slope sculptured with strong, upcurved ridges, which sometimes extend slightly on to the disk, which is otherwise smooth and shining; left valve with two rather stumpy, roughened pseudocardinals and 1-2 somewhat blurred, granulous laterals; right valve with a single blunt pseudocardinal, the hinge line in front of which is excavated, and a curious blurred lateral, which is sometimes slightly split up; beak cavities shallow; dorsal scars few; nacre whitish. Animal unknown.

Type, *Unio pfisteri* Heude.

I have placed in this group a number of forms which seem to be rather closely related and have given the group generic rank, because I could not refer the species to any known genus. All are oblong forms with dark epidermis, with more or less plicate sculpture on the dorsal slope. The pseudocardinals are solid and generally triangular, the laterals usually remote and not strongly developed.

Key to species of Ptychorhynchus.

Shell regularly long ovate or nearly so.
  Posterior ridge well developed, epidermis olive-green. *P. pfisteri.*
  Posterior ridge low, epidermis blackish-brown. *P. lævis.*
Shell more or less long rhomboid.
  Posterior ridge double, shell biangulate behind, *P. nieuwenhuisi, apicellatum.*
  Posterior ridge not double.
    Shell rather short. *P. schomburgianum.*
    Shell somewhat elongated, *P. murinum.*

Group of *Ptychorhynchus pfisteri.*

Characters as in the genus.

PTYCHORHYNCHUS PFISTERI (Heude).

Shell almost evenly long elliptical or long ovate, convex or subinflated, rather solid, inequilateral; beaks but slightly elevated; posterior ridge well-developed, subangular or narrowly rounded, ending behind in a blunt point on the median line; surface of the disk nearly smooth, exhibiting a few feeble, low, concentric ridges; posterior slope everywhere covered with strong, corrugated plications; epidermis shining, olive-green; pseudocardinals two in the left valve and one in the right, stumpy, nearly smooth and even in size; laterals remote, rather feeble, two in the left valve and a partially double one in the right; beak cavities shallow with a few, faint dorsal scars; muscle scars but slightly impressed; nacre whitish, iridescent behind; pallial line with indications of a posterior sinus.

Length 77, height 34, diam. 20 mm.

Nankin River, China.

Unio pfisteri HEUDE, Jl. de Conch., XXII, 1874, p. 112; Conch. Fluv. Nank., I, 1875, pl. 1, fig. 1.

Ptychorhynchus pfisteri SIMPSON, Syn., 1900, p. 851.

This species bears some external resemblance to the North American *Ptychobranchus subtentus*, but lacks the square blotches.

Var. *inspiratum* (Heude).

Seems to differ from the type in having less sculpture on the dorsal slope and the posterior point more drawn down. I am doubtful whether it is worthy of varietal rank.

Unio pfisteri var. *inspiratus* HEUDE, Conch. Fluv. Nank., II, 1877, pl. XIV, fig. 28.

Ptychorhynchus pfisteri var. *inspiratus*, SIMPSON, Syn., 1900, p. 851.

Var. *mediastinum* (Heude).

Heude separates this from his *Unio pfisteri* on account of its having more elevated beaks than that species. The type of *U. pfisteri*, according to the figure, is so badly eroded in the umbonal region that nothing of the beaks can be made out. That of *U. mediastinus* is also somewhat eroded and its beaks are not at all full. The posterior end of the type is a little more blunt than the National Museum specimens or Heude's figures of *U. pfisteri*.

China.

Unio mediastinus Heude, Conch. Fluv. Nank., VIII, 1883, pl. LXIII, fig. 123.

Ptychorhynchus mediastinus Simpson, Syn., 1900, p. 851.

Ptychorhynchus lævis Haas.

"Shell elongate-elliptical, subsolid, rather compressed, rounded in front, bluntly pointed behind about the middle of the height; posterior ridge low, rounded; angulate, basal margin regularly curved. Beaks somewhat prominent, situated at 29-100 of the total length; their sculpture is invisible on account of erosion. Epidermis smooth, shining, of a blackish-brown, with darker lines of growth. Hinge consisting of two cardinals and vestiges of two laterals in the left, one cardinal and vestiges of one lateral in the right valve. Cardinals high, the one of the right valve pyramidal, the anterior one of the left valve smaller and lower than the posterior one, almost triangular. Laterals very short, low, only indicated; interval long, narrow and smooth. Anterior cicatrices deep, rough, that of the anterior adductor and that of the anterior retractor confluent. Posterior cicatrices distinct, faint. Dorsal cicatrices united to a narrow groove situated at the inner side of the interval. Beak-cavities shallow. Nacre reddish, bluish at the margin, not brilliant.

Length 59, height 31, diam. 16 mm." (Haas).

Type locality, Saghalin Island.

Ptychorhynchus lævis Haas, Ann. Mag. Nat. Hist., (8), VI, 1910, p. 498.

Group of *Ptychorhynchus apicellatum*.

Shell subrhomboid, more or less biangulate behind

PTYCHORHYNCHUS APICELLATUM (Heude).

Shell somewhat elongated, subrhomboid, being a little higher behind than in front, rather solid, convex, inequilateral; anterior end rounded; base line nearly straight; dorsal outline lightly curved; dorsal slope obliquely truncate; posterior ridge widely, feebly double, ending in a biangulation at and below the median line; beaks apparently low, plicate sculptured; surface with faint, concentric sculpture and with numerous delicate plications on the dorsal slope; epidermis yellowish-black; pseudocardinals rather solid, striate; laterals remote, not strongly developed; nacre brownish-rose.

Length 60, height 33, diam. 16 mm.

Torrents of Tche-tcheou fou, province of Ngan-houe, China.

Unio apicellatus HEUDE, Conch. Fluv. Nank., VIII, 1883, pl. LXIII, fig. 126.

Ptychorhynchus apicellatus SIMPSON, Syn., 1900, p. 851.

Heude states that the beaks of this in a young state are delicately plicate sculptured, but whether the plications are zigzag, radial or concentric he does not inform us.

PTYCHORHYNCHUS SCHOMBURGIANUM (Heude).

Shell elliptic rhomboid, moderately solid, subinflated, inequilateral; beaks but slightly elevated; anterior end narrowed a little, rounded; base line lightly curved; posterior ridge rounded; dorsal outline somewhat arched; dorsal slope obliquely subtruncate, below the truncation the shell is rather narrowly rounded; surface brownish-black; dorsal slope having a few faint plications; pseudocardinals pyramidal, solid, oblique, serrulated; lateral double in the right valve, obsolete in the left; muscle scars well marked; nacre salmon, fuscous, shining, radiately striate, concentrically iridescent.

Length 52, height 25, diam. 17 mm.

Isle of Hainan, China.

Unio schomburgianus Heude, Conch. Fluv. Nank., IX, 1885, pl. LXXII, fig. 139.—Fischer, Jl. de Conch., XL, 1892, p. 314.

Ptychorhynchus schomburgianus Simpson, Syn., 1900, p. 851.

Close to *P. apicellatum*, but less decidedly rhomboid and not distinctly biangulate behind. It seems to stand between that species and the varieties of *pfisteri*. Heude states that the epidermis is radiate, but the figure does not show it.

Ptychorhynchus nieuwenhuisi (Schepman).

Shell long, subrhomboid, convex or almost compressed, inequilateral; beaks apparently low and subcompressed; posterior ridge low, widely double, ending behind in a wide biangulation from a point below the median line to the base; anterior end very slightly narrowed, rounded; base line nearly straight; dorsal line lightly curved; dorsal slope obliquely truncate above, the truncation meeting the dorsal line at a low angle and the biangulation below at a sharper angle; surface apparently concentrically striate, the striation coarser below; posterior end of the shell covered with rather fine, curved, radiating folds which are slightly divaricate on the upper part of the posterior ridge; epidermis dark brown, fibrous; hinge strong; one thick pseudocardinal in the right valve and two in the left; one lateral in the right valve and two in the left, lightly curved and crenate posteriorly; anterior scars deep, irregular; posterior scars shallow; pallial line distinct; nacre iridescent, olive-yellow in the cavities, bluish-white on the border. A flat callosity runs from the beaks within obliquely towards the ventral margin.

Length 69, height 40, diam. 19 mm.

Bloe-oe, East Borneo.

Unio nieuwenhuisi Schepman, Notes Leyd. Mus., XX, 1898, p. 92, pl. I, figs. 1, 2.—Drouet, Jl. de Conch., XLVII, 1899, p. 406.

Unio newenhuisi Simpson, Syn., 1900, p. 803.

Schepmania nieuwenhuisi Haas, Con. Cab., Unio, 1910, pl. XII, fig. 3.

Although the original description of this species is very full I am unable to feel any certainty as to where it belongs. Nothing is known of the anatomy and the entire umbonal region is so badly eroded in the specimen figured that no idea can be formed of the beak sculpture. The form is almost exactly that of *Unio complanatus* save that it is more widely and distinctly biangulate behind. I place it with some doubt near the *Unio apicellatus* of Heude. The solid pseudocardinals, the posterior plications and its form and color are something like that shell.

Haas has recently, (Nachr. Deutsch. Mal. Ges., 1913, p. 33), made this species the type of a new genus, *Schepmania*.

Var. *parcesculptum* (von Martens).

"Shell oblong, compressed, thick, closely, concentrically striate and sculptured on the posterior slope near the umbones with upward curved folds, often slightly divided; very short and rounded in front, elongate and subtruncate behind; umbones quite compressed, eroded; posterior dorsal margin subhorizontal as far as the sinulus, thence with a very obtuse angle sloping gradually to one-half of the height of the shell; posterior margin straight, slightly oblique, separated from the ventral margin by a more or less distinct angle; ventral margin posteriorly and in the centre subhorizontal, very slightly curved, in the anterior third at first a little, then sharply ascending. Nacre milky-white, slightly pearly; cardinal tooth of the right valve strong, conic-triangular, crenulate; posterior cardinal tooth of the left valve not quite so strong, conic, anterior weak, compressed triangular; laterals straight.

Length 70, height 43, diam. 20 mm." (von Martens).

Type locality, Guleh River, East Borneo.

Unio (Quadrula) nieuwenhousi var. *parcesculptus* von Martens, S. B. Ges. Naturf. Fr., 1903, p. 425.

Schepmania parcesculpta Haas, Con. Cab., Unio, 1910, pl. xii, fig. 4.

"Differs from the species described by Schepman as well as from the typical form from East Borneo by the weaker sculpture; the curved folds reach the dorsal margin only very near the beaks, but do not near the postero-dorsal angle nor along the posterior slope, but stop 6-12 mm. from it; the post-basal point is also less distinctly angulated."

PTYCHORHYNCHUS MURINUM (Heude).

Shell almost evenly oblong elliptical, very slightly rhomboid, subsolid, inequilateral, beaks low; posterior ridge widely rounded; anterior end rounded; dorsal and basal outlines nearly straight and parallel; posterior end obliquely subtruncate above, rounded below; surface concentrically striate, very feebly plicate on the dorsal slope, blackish-iridescent; pseudocardinals subtriangular, conoid, striate; laterals remote; nacre flesh-colored.

Length 50, height 23, diam. 20 mm.

Nanking, China.

Unio compressus HEUDE, Conch. Fluv. Nank., III, 1877, pl. XXIV, fig. 52.

Unio murinus HEUDE, Conch. Fluv. Nank., VIII, 188$_3$, pl. LXII, fig. 121.

Unio morinus PÆTEL, Conch. Sam., III, 1890, p. 160.

Ptychorhynchus incertus SIMPSON, Syn., 1900, p. 851.

In this case again Heude contradicts his measurements. He states that the shell is compressed, and gives the height as 23 millimeters and the diameter 20, which would make a much inflated shell. The species is apparently close to *schomburgianum,* but is more elongated in proportion to height, and is not quite so rhomboid. The name *compressus* given by Heude to this species was long before preoccupied by Lea in *Unio.* That the epidermis should be blackish-iridescent ("sub-nigra iridescente") seems peculiar, but that is the statement made in the original description.

Genus VIRGUS, Simpson, 1900.

Virgus SIMPSON, Syn., 1900, p. 851.

Shell rather solid, elongated, inequilateral, compressed, rounded in front, nearly straight below, the dorsal line as far back as the hinder end of the ligament parallel with the base, behind the ligament the shell is obliquely truncate, the truncation somewhat upcurved, the shell ending in a rounded point at the posterior base; posterior ridge elevated, rounded, with sculpture radiating from it above and below; beaks rather low, radially ridged; pseudocardinals small, two in each valve; laterals rather short, club-shaped, one in the right and two in the left valve.

Animal unknown.

Under this generic name I have placed three species from New Guinea and Borneo, which agree quite well in general conchological characters. The shells are quite elongated, the dorsal and ventral outlines nearly parallel to the hinder part of the ligament. The ventral line is nearly straight throughout; the dorsal slope is cut away above in a long oblique truncation or subtruncation to a blunt point near the base of the shell. The beaks are low and, no doubt, subradially sculptured; the pseudocardinals are short and rather strong; the laterals club-shaped. The group differs from *Rectidens* in having solider shells, and strong, short pseudocardinals as well as heavier laterals.

KEY TO SPECIES OF VIRGUS.

Posterior ridge rounded, separated from the rest of the shell by sulci,	*V. beccarianus.*
Posterior ridge with strong devaricate ridges,	*V. mattiroli.*
Posterior ridge widely rounded,	*V. misoolensis.*

Group of *Virgus beccarianus.*

Shell having the posterior ridge high and rounded, outlined on each side by a sulcus, the radiations from this ridge rather fine; surface concentrically sculptured.

VIRGUS BECCARIANUS (Tapperone-Canefri).

Shell elongated, subinflated, inequilateral, the base line nearly straight; dorsal line almost parallel with the base line as far back as the hinder end of the ligament, behind which point it is carried out with a slight curve to the extreme hind end of the shell; anterior end rounded; posterior ridge high, narrowly rounded, separated above and below from the rest of the shell by a sulcus, the ridge ending behind at the base of the shell; surface with dense, concentric striæ, which are crossed below the posterior ridge with strong, nearly vertical folds; dorsal slope sculptured with folds; epidermis olivaceous-fuscous; pseudocardinals small, sulcate above, unequally dentate on the margin; laterals elongated; nacre silvery or bluish white. The beaks are tumid and plicate.

Length 90, height 29, diam. 16 mm.

Fly River, New Guinea.

Unio beccarianus Tapperone-Canefri, Ann. Mus. Genov., XIX, 1883, p. 291, pl. xi, fig. 2.

Virgus beccarianus Simpson, Syn., 1900, p. 852.—Haas, Con. Cab., Unio, 1910, p. 129, pl. xiii, fig. 1.

A greatly elongated shell which is drawn out to a point behind at the base. It is remarkable for its high, rounded posterior ridge, which is separated from the rest of the surface by distinct sulci and for the vertical plications below it.

Group of *Virgus mattiroli.*

Posterior ridge full, rounded, not outlined by sulci, covered with very strong corrugated ridges, which curve outward each way from the center, the remainder of the shell smooth.

Virgus mattiroli (Tapperone-Canefri).

Shell somewhat elongated, solid, inequilateral, subinflated; base line nearly straight; dorsal line parallel with it as far back as the hinder end of the ligament, from that to the posterior point it is slopingly truncate; anterior end rounded; posterior ridge full, ending in a rounded point at the base of the shell, sculptured throughout its length with very strong, divaricate ridges; beaks only moderately full; pseudocardinals two in each valve subcompressed, laterals club-shaped, one in the right valve and two in the left; nacre bluish-white.

Length 52, height 26, diam. 15 mm.

Fly River, New Guinea.

Unio mattiroli TAPPERONE CANEFRI, Ann. Mus. Genov., XIX, 1883, p. 292, pl. XI, fig. 1.

Virgus mattiroli SIMPSON, Syn., 1900, p. 852.

Virgus mattirolii HAAS, Con. Cab., Unio, 1910, p. 131, pl. XIII, fig. 2.

Apparently more solid than *U. beccarianus.* It is not so greatly elongated as that species and may be at once distinguished by the very strong, divaricate sculpture along the entire length of the posterior ridge.

Group of *Virgus misoolensis.*

Posterior ridge merely rounded, with radiating folds scattered over the shell, pseudocardinals two in the left valve and one in the right.

VIRGUS MISOOLENSIS (Schepman).

Shell elongated, rather compressed, very inequilateral, nearly smooth, with numerous, fine, concentric striæ; beaks but slightly prominent, with conspicuous, radiating folds, extending more or less over the disk of the shell; there are a few radiating grooves on the anterior end, and microscopic, radiating wrinkles of the epidermis on the posterior slope; epidermis reddish-brown in the adult, yellowish-olive-green in the young state; dorsal outline lightly arcuate from the beaks to the extreme posterior end near the base; base line almost straight; anterior end rounded; posterior ridge full, simply, widely rounded, ending near the base in a rounded point; nacre bluish-white, iridescent behind; thicker in front; scarcely more than one short, thick, crenated pseudocardinal in each valve; a small knob in the left valve may perhaps be considered a second one; laterals club-shaped, elongated, two in the left valve and one in the right; anterior scars deep.

Length 65, height 24, diam. 16 mm.

Misool, Borneo.

Unio misoolensis SCHEPMAN. Notes from Leyd. Mus., XVIII, 1896, p. 259, fig.

Virgus misoolensis Simpson, Syn., 1900, p. 852.—Haas, Con. Cab., Unio, 1910, p. 133, pl. xiii, fig. 3.

I have given Schepman's very excellent description almost entire. He states that the nacre is much thickened near the anterior ventral part, forming a callus connecting with another running from the umbones to it. He believes it to be most nearly allied to the *Unio beccarianus* of Tapperone-Canefri. It differs from that in having a wider posterior ridge, which is not marked off from the rest of the shell.

For this species, Haas, (l. c., p. 132), has proposed a new section, *Leiovirgus*.

Genus CHRISTADENS Simpson. n. n.

Ctenodesma Simpson, Syn., 1900, p. 852.

Shell subtrapezoid to long elliptical, rather thin, compressed, with a scarcely developed posterior ridge and low beaks, whose sculpture is densely zigzag-radial, becoming finely corrugated or nodulous on the disk and extending over most of the shell; the disk is concentrically striate or sulcate at its outer edge; pseudocardinals one to two in each valve, very diverse in form, but showing a tendency to break up into denticles; one lateral and sometimes a faint secondary one in the left valve and two in the right; dorsal scars few, diversified in form, and variously disposed in the shallow beak cavities; anterior muscle scars united; nacre whitish.

Animal unknown.

Type, *Unio borneensis* Issel.

In the Synopsis I placed under the generic name *Ctenodesma* two species of Uniones, which I am unable to refer to any other generic combination. This name having been preoccupied by Cook in Myriopoda, I change it to *Cristadens*.

The species placed here are elongated, somewhat compressed forms, covered with a peculiar, fine pattern of broken, zigzag sculpture. The pseudocardinals are much lacerated, being in some cases cut into numerous teeth.

CRISTADENS BORNEENSIS (Issel).

Shell long rhomboid, rather thin, subcompressed, inequilateral; dorsal and ventral outlines nearly straight and parallel; anterior end rounded; dorsal slope obliquely truncate or subtruncate; posterior ridge low, rounded, ending near the base in a blunt point; beaks but little elevated, the sculpture consisting of numerous, close-set zigzag-radial, subnodulous ridges. This sculpture extends well out over the disk and gradually changes to fine, irregular, concentric sculpture; sculpture on the dorsal slope subplicate; epidermis yellowish-green or brownish-green, often with several wide or narrow green rays on the dorsal slope; pseudocardinals compressed, ridged, often cut up into dentilations; laterals delicate, straight, remote; nacre bluish-white, iridescent.

Length 48, height 23, diam. 13 mm.

Borneo; Siam; Malacca.

Unio plicatulus LEA, Pr. Ac. Nat. Sci. Phila., III, 1859, p. 152; Jl. Ac. Nat. Sci. Phila., IV, 1860, p. 247, pl. XXXVII, fig. 126; Obs., VII, 1860, p. 65, pl. XXXVII, fig. 126.—REEVE, Conch. Icon., XVI, 1865, pl. XXII, fig. 102.

Margaron (Unio) plicatulus LEA, Syn., 1870, p. 31.

Unio borneensis ISSEL, Moll. Borneo, 1874, p. 113.

Ctenodesma borneensis SIMPSON, Syn., 1900, p. 853.—HAAS, Conch. Cab., Unio, 1912, p. 135.

Virgus borneensis HAAS, Con. Cab., Unio, 1910, pl. XIII, figs. 4-5.

Unio penisatus FISCHER and CROSSE, Miss. Sci., Pt. 7, II, 1894, p. 599.

Three specimens of the above are before me, none of which are quite so large as the type, which is not in the Lea collection. Two of these shells are more rounded behind than the type; in all of them the epidermis is somewhat wrinkled. Two have bright green posterior rays; the other is rayless.

Lea's name was preoccupied by Kuster, or Charpentier, for a Mexican species in 1856. The name proposed by Issel in 1874 will have to be used.

The name *penisatus* was proposed by Fischer and Crosse, because Lea's name *plicatulus* was preoccupied by Kuster.

CRISTADENS GUPPYI (Smith).

Shell oblong elliptical, very inequilateral, a little higher behind, subsolid, subcompressed or convex; beaks not prominent, sculptured with a great number of zigzag-radial, wavy, fine ridges, the sculpture extending well on to the disk; surface with irregular, rather strong, concentric sculpture and faint vestiges of radial grooves; posterior ridge low, rounded; anterior end narrowed and rounded; outlines of dorsum and base nearly straight; posterior end irregularly rounded, the upper part slightly and obliquely truncate; epidermis thick, reddish-brown, peeling off behind showing the iridescent shell; pseudocardinals small, often split into numerous denticles; laterals small, remote, straight; anterior scars impressed; nacre bluish-white, bronzy iridescent behind, thicker in front.

Length 69, height 32, diam. 19 mm.

Length 67, height 33, diam. 15 mm.

Shortland Island; Solomon Islands.

Unio guppyi SMITH, Pr. Zool. Soc. Lond., 1885, p. 608, pl. XXXVII, figs. 88*a*, 88*b*.

Ctenodesma guppyi SIMPSON, Syn., 1900, p. 853.—HAAS, Con. Cab., Unio, 1910, pl. XIII, figs. 6-7.

The above measurements are from two fine specimens in the National Museum collection from the Solomon Islands. The whole surface shows a tendency to feeble granulation.

CRISTADENS BEAUFORTI (Bavay).

"Shell irregularly elliptical, slightly inflated, not very thick, beaks placed quite anteriorly; anterior end short, truncate and rounded, posterior end elongated, rounded and compressed above, angulate below, ventral margin almost straight, slightly curved in the middle; a very large ridge extends from the beaks to the lower posterior angle; epidermis heavily striate in front and behind, smoother in the centre of the disk. Cardinal teeth weak, short, that of the right valve bifid; laterals long and thin, not extending beyond the ligament, the right slightly prominent, the left bifid. Epidermis bronzy, greenish-black; nacre bluish-white.

Length 70, height 37, diam. 20 mm." (Bavay).

Type locality, Lake Sentani, New Guinea.

Unio beauforti Bavay, Nova Guinea, 1908, p. 291, pl. xiv, fig. 16.

"This species is very near to *U. guppyi* E. Smith of Shortland Island, Solomon Group, which itself resembles many forms from Australia and New Zealand."

Genus RECTIDENS Simpson, 1900.

Rectidens Simpson, Syn., 1900, p. 853.

Shell elongated, with an angle at the anterior dorsal part, pointed and slightly biangulate behind, moderately solid, with two or three posterior ridges, the lower the higher; beaks full, sculpture not observed, but probably zigzag-radial; the posterior slope, and often part of the disk, covered with faint, granular, radiating sculpture; epidermis smooth, olive; one compressed, short, recurved pseudocardinal in the left valve under the beak, and a very long one in front of it, and two laterals; two compressed pseudocardinals in the right valve, and a single lateral; all the teeth straight or nearly so; anterior muscle scars separate; beak cavities rather shallow; only one or two dorsal scars in each valve; nacre white or reddish.

Animal unknown.

Type, *Unio prolongatus* Drouet.

The species placed in this group seems to be closely allied and are characterized by much elongated shells with rather low beaks and delicate, lamellar pseudocardinals and laterals, which are granular or more or less vertically striate. There is generally a feebly double posterior ridge, each part being pinched up in the upper part. All the species seem to have traces of radical sculpture.

Key to species of Rectidens.

Shell inflated, strongly concentrically sculptured, *R. perakensis.*

Shell compressed to convex, not strongly concentrically sculptured.

Small to medium sized.
  Uniform brownish, subcompressed. *R. lingulatus.*
  Greenish, rayed behind. *R. orientalis.*
Medium sized, convex. *R. pressirostris; prestoni; sumatrensis.*
Large.
  Truncate before and behind. *R. gracilis; palembangensis; pahangensis.*
  Not truncate in front or behind, *R. prolongatus.*

RECTIDENS SUMATRENSIS (Dunker).

Shell elongate ovate, inequilateral, subsolid, convex, or subinflated; beaks rather low, not much inflated; anterior end rounded, a little fuller above; base line nearly straight, full towards the posterior end; dorsal outline curved to the posterior point, which is placed just below the median line; posterior ridge rounded; surface somewhat strongly, concentrically striate, subgranose; epidermis dark olive-brown or blackish; hinge line lightly curved; teeth delicate, compressed, pseudocardinals subcrenate; nacre reddish or violet-tinted, beautifully iridescent.

Length 74, height 30, diam. 20 mm.

Lake Dana Luar, Sumatra.

Unio sumatrensis DUNKER, Zeits. für Mal., IX, 1852, p. 52.—PFEIFFER, Nov. Conch., II, 1866, p. 152, pl. xxxix, figs. 10-12.

Rectidens sumatrensis SIMPSON, Syn., 1900, p. 853.—HAAS, Conch., Cab. Unio, 1912, pl. 28, figs. 3-6.

This species, which is quite evenly long ovate, has delicate granulations on a part of its surface, according to Dunker. I have seen a shell, which is probably this species, which is richer-colored within and without, and is more nearly ovate in outline than the other members of the group.

RECTIDENS PRESSIROSTRIS (von Martens).

"Shell elongate, concentrically striate and distantly lirate, dirty brown, anterior end inflated, rounded, posterior compressed, obtusely rostrate, posterior ridge well marked, but not reaching the margin, central parts of the dorsal and ventral margins nearly straight; beaks situated at 1/7 of the length; nacre bluish, pale yellowish in the centre; cardinal teeth compressed, elongate, parallel to the margin, slightly rugose, laterals long, straight.

Length 87, vertical height 31, alæ 27, diam. 25 mm." (von Martens).

Type locality, Lake Danau Baru, Indragiri, Sumatra.

Unio pressirostris von Martens, Nachr. Deutsch. Mal. Ges., 1900, p. 14.

Rectidens pressirostris Haas, Conch. Cab., Unio, 1912, pl. 27, figs. 1-3.

"Stands in the same relation to *U. sumatrensis* Dunk. as the European *U. platyrhynchus* F. Schmidt does to *pictorum*."

RECTIDENS PRESTONI n. n.

"Shell closely allied to *Unio pressirostris* von Martens, of which it may ultimately prove to be a variety, but differing from that species in its less cuneate form and larger size, in its less contracted anterior side and more obtuse and sloping posterior side.

Long. 31, lat. 85.5, diam. 21 mm." (Preston.)

Type locality, Perak.

Unio perakensis Preston, Rec. Ind. Mus., VII, 1912, p. 287, pl. viii, figs. 5-6.

"*Perakensis*" having already been used by de Morgan for a species of *Unio*, I have changed the name as above.

RECTIDENS LINGULATUS (Drouet and Chaper).

Shell elongated, scarcely subsolid, subrhomboid, convex or subcompressed, inequilateral; dorsal and ventral outlines nearly straight and parallel; anterior end angled above, slopingly rounded below; dorsal slope having a long, oblique truncation; posterior ridge not greatly elevated but angled, usually with a smaller ridge above it, ending in a blunt point near the base of the shell; surface with irregular growth lines, the middle of the disk often granular and occasionally having vertical plications; dorsal slope usually having fine, radial folds;

epidermis greenish-brown; teeth delicate, lamellar, the pseudocardinals somewhat strongly vertically striate; muscle scars shallow; nacre bluish.

Length 65, height 27.5, diam. 15.5 mm.

Borneo.

Unio lingulatus DROUET and CHAPER, Mem. Soc. Zool. Fr., V, 1892, p. 148, pl. v, figs. 7-9.

Rectidens lingulatus SIMPSON, Syn., 1900, p. 854.—HAAS, Conch. Cab., Unio, 1912, pl. 27, figs. 4-5.

A rather delicate species, of which a number of examples are before me. In all of them the beaks are deeply eroded, but they are probably not prominent. It is a smaller, less inflated and rougher species than *prolongatus*.

RECTIDENS PROLONGATUS (Drouet).

Shell elongated, subsolid, subinflated, inequilateral; beaks moderately full and high; dorsal and ventral outlines nearly straight and parallel; anterior end rounded, angled above; posterior ridge narrowly double above, each part pinched up into a ridge, fading out behind, ending in a feeble biangulation at and below the median line; dorsal slope obliquely truncate; surface with scattered, low, concentric ridges, with faint traces of radical sculpture; dorsal slope with feeble plications; epidermis dark greenish-brown, subshining; teeth lamellar, the pseudocardinals much elongated; muscle scars shallow; nacre blue, sometimes flesh-color in the cavities.

Length 110, height 42, diam. 30 mm.

Borneo.

Unio prolongatus DROUET, Rev. Biol. Nord. Fr., VI, 1894, p. 216.—KOBELT, Abh. Senck. Nat. Ges., XXIV, 1897, p. 87, pl. XI, figs. 1, 2.

Rectidens prolongatus SIMPSON, Syn. 1900, p. 854.—HAAS, Conch. Cab., Unio, 1912, pl. 26, figs. 1-5.

Much larger than *lingulatus*, more inflated, more shining and having more elongated pseudocardinals. The nacre is somewhat granularly radiate striate.

RECTIDENS PERAKENSIS (de Morgan).

Shell elongated, solid, inflated, inequilateral, nearly ovate; anterior end slightly angled above; posterior ridge rather high, subangulate or very narrowly rounded, ending in a point a little below the median line; beaks only slightly elevated; surface with strong, concentric ridges and very delicate radiating threads; epidermis thick, brilliant, olivaceous; pseudocardinals lamellar, double in the right valve and single in the left; laterals single in the right valve, double in the left; nacre whitish-tinted lead-color, somewhat reddish in the beak cavities.

Length 80, height 30, diam. 22 mm.

Perak.

Unio perakensis DE MORGAN, Bull. Soc. Zool. Fr., X, 1885, p. 424, pl. IX, figs. 3, 4.

Rectidens perakensis SIMPSON, Syn., 1900, p. 854.—HAAS, Conch. Cab., Unio, 1912, pl. 29, figs. 2-8.

More inflated and solid than the preceeding species and having stronger concentric sculpture.

RECTIDENS PAHANGENSIS (Smith).

Shell elongated, convex, subsolid, inequilateral; beaks very low; posterior ridge apparently double and ending in a wide biangulation; anterior end squarely truncate, subangular above; base line curved; dorsal slope with a long, oblique truncation; posterior end almost squarely truncate; surface concentrically striate; epidermis fuscous; teeth lamellar, rather delicate, pseudocardinals roughened; muscle scars well marked; nacre pale yellowish-salmon.

Length 131, height 50, diam. 24 mm.

Pahang River, Malay Peninsula.

Unio pahangensis E. A. SMITH, Pr. Mal. Soc. Lond., III, 1899, p. 315, fig.

Rectidens pahangensis SIMPSON, Syn., 1900, p. 854.—HAAS, Conch. Cab., Unio, 1912, pl. 29, fig. 1.

The distinctive characters of this species seem to be the truncation of the anterior and posterior ends and the unusually low beaks. In the specimen figured they are slightly eroded, but they do not rise above the outline of the shell.

RECTIDENS ORIENTALIS (Lea).

Shell somewhat elongated, subelliptical or subrhomboid, convex, inequilateral, scarcely subsolid; dorsal line nearly straight; anterior end rounded, full and almost subangulate above; base line curved, full behind the middle; dorsal slope obliquely subtruncate; beaks scarcely raised; posterior ridge subangulate, pinched-up above, ending below the median line in a rounded point; above the posterior ridge there is a low, radial pinched-up ridge; epidermis nearly smooth, showing feeble corrugations at the anterior end and traces of nodules on the disk, yellowish-green with green bands and two green rays on the posterior end, shining; teeth compressed; the pseudocardinals showing a tendency to break up into dentilations; nacre bluish, yellow-tinted in the cavities of the shell.

Length 38, height 16.5, diam. 9 mm.

Java.

Unio orientalis LEA, Pr. Am. Phil. Soc., I, 1840, p. 285; Tr. Am. Phil. Soc., VIII, 1842, p. 221, pl. XVIII, fig. 38; Obs., III, 1842, p. 59, pl. XVIII, fig. 38.—CHENU, Ill. Conch, 1858, pl. XXXII, figs. 6, 6*a*, 6*b*.—KUSTER, Conch. Cab. Unio, 1861, p. 241, pl. LXXX, fig. 16.—SOWERBY, Conch. Icon., XVI, pl. XCI, fig. 491.

Margaron (Unio) orientalis LEA, Syn., 1852, p. 38; 1870, p. 61.

Nodularia orientalis SIMPSON, Syn., 1900, p. 819.

Elongaria orientalis HAAS, Con. Cab., Unio, 1910, pl. XVII., figs. 3-5.

Unio productus MOUSSON, L. and S. W. Moll., Java, 1849, p. 93, pl. XVII, figs. 3-5.

Unio productior LEA, Syn. 1852, p. 29.

Lea's shell, the type of *Unio orientalis,* is, no doubt, young and it seems to be identical with fig. 5, plate XVII, in Mousson's Land and Susswasser-Mollusken von Java, which he refers to his *Unio productus.* I am not at all sure that his figure 3 on the same plate represents this species, as it has more the appearance of some of the European forms of the group of *Unio pictorum.*

Haas has recently (Nachr. Deutsch. Mal. Ges., 1913, p. 34), made this species the type of a new genus, *Elongaria.*

RECTIDENS GRACILIS (Strubell).

"Shell much elongated, subcompressed, rather thin, delicately, costulate striate, not at all shining, brownish-olivaceous, very inequilateral, squarely truncate in front, much elongated posteriorly. Dorsal margin forming an angle with the very short anterior margin; posteriorly it runs into the posterior slope with a rounded angle; ventral margin horizontal, not at all ascending posteriorly, forming with the posterior margin a depressed, subvertically truncated rostrum. Umbones anterior, deeply eroded; areola subobsolete; area elongate, compressed, with two obsolete carinae extending from the beaks; ligament thin, quite long. Hinge thin; with two, elongate, oblique, compressed, low teeth in the right valve, almost reaching the margin; cardinal tooth elongate, with obsolete lamellæ; muscular impressions indistinct. Nacre bluish-white, iridescent posteriorly.

Length 55, height 23, diam. 12.5 mm." (Strubell.)

Type locality, South Sumatra.

Microndylæa gracilis STRUBELL, Nachr. Deutsch. Mal. Ges., 1897, p. 8.

Rectidens gracilis HAAS, Conch. Cab., Unio, 1912, pl. 27, fig. 6.

"It differs from *M. hageni* not only by its much more striate surface, but also by its heavy, stronger development of the hinge-teeth." (Strubell).

Haas, (l. c.), figures *U. palembangensis* Strubell and *U. pahumbaënsis* von Martens as synonyms of this species.

RECTIDENS PALEMBANGENSIS (Strubell).

"Shell very long ovate, very inequilateral, delicately and closely striate, here and there roughly costate-sulcate, posterior end distinctly biangulate, scarcely shining, rather thin, olivaceous, overlaid with a thin gray deposit. Anterior end very short, posterior elongate. Dorsal margin very slightly oblique, forming with the very short, rounded, subtruncate anterior margin a distinct angle and with the sloping posterior margin an indistinct one; ventral margin almost straight, slightly ascending posteriorly to the roundly-acuminate, depressed rostrum. Beaks situated at ¼ of the length, low, deeply eroded, not approaching; areola narrow, almost lanceolate; posterior slope compressed, margined by the distinct posterior ridge; ligament narrow, quite long. Hinge with a thin, narrow lateral and two, elongate, curved, lamelliform, equal cardinal teeth in the right valve, one cardinal and an obsolete posterior accessory tooth in the left, the long laterals forming an angle with the cardinals; muscular and pallial impressions not very strong; nacre bluish-white, somewhat livid under the umbones.

Length 43, height 17.5, diam. 11 mm. (Strubell).

Type locality, South Sumatra.

Unio palembangensis STRUBELL, Nachr. Deutsch. Mal. Ges., 1897, p. 10.—SIMPSON, Syn., 1900, p. 862.—HAAS, Conch. Cab., Unio, 1912, pl. 27, fig. 7.

Haas, (l. c.), considers this a synonym of *Rectidens gracilis*.

Var. *pahumbaënsis* (von Martens).

"Differs by the shorter and posteriorly more elevated form, as well as that the posterior ridge very soon disappears, so that it is distinctly seen only in the umbonal region. The rostrum of this form is like that of the typical form, somewhat declined, owing to the fact that the dorsal margin is oblique, while the basal margin is almost straight, while in the closely related *U. sumatrensis* Dunk., the posterior margin descends almost as much as the basal ascends, so that the rostrum points backward.

Length 53, height at beaks 19, at wing 23, diam. 13 mm.

Beaks situated at ¼ of the length." (von Martens).

Type locality not given.

Unio palembangensis var. *pahumbaënsis* VON MARTENS, Nachr. Deutsch. Mal. Ges., 1900, p. 14.

Unio pahoembaensis HAAS, Conch. Cab., Unio, 1912, pl. 28, figs. 1-2.

Haas, (l. c.), considers this a synonym of *Rectidens gracilis*.

Genus LAMELLIDENS Simpson, 1900.

Lamellidens SIMPSON, Syn., 1900, p. 854.—ORTMANN, Ann. Car. Mus., VIII, 1912, p. 277.

Shell elongate, elliptical, pointed behind, with a slight post-dorsal wing, a low, often biangulate, posterior ridge and generally two sharp, radiating liræ above it; beaks with curved, radiating ridges, which sometimes are slightly zigzag, and often become almost concentric, but which fade out as they approach each other at the center of the disk; epidermis smooth, generally shining, brownish, often with concentric bands of lighter color, rayless or nearly so; left valve with two compressed pseudocardinals, the front one roughened, and two laterals; right valve with two parallel, lamellar pseudocardinals and one lateral; cavity of the beaks rather shallow; dorsal scars few, deep, distinct, scattered; anterior scars separate; nacre bluish-white to straw.

Animal unknown.

Type, *Unio marginalis* Lamarck.

The genus *Lamellidens* contains a number of closely allied species, which seem quite distinct from other Naiades of the Oriental Region. The group appears to be closely allied to the subgenus *Hyridella* of *Diplodon* so far as shell characters have been observed. The beak sculpture consists of subradial curved bars much like that of the Australian species, but they sometimes are slightly zigzagged. The general texture and color of the shells are something like those of the Australian species, the epidermis being usually dark and always rayless.

If I am correct in placing the *Anodonta guillaini* of Riecluz in this group it will be seen that *Lamellidens* has a distribution somewhat similar to that of *Nodularia* and *Parreysia*.

KEY TO SPECIES OF LAMELLIDENS.

Shell with imperfect hinge teeth, *L. guillaini.*
Shell with well developed hinge teeth.
  With a moderately developed post-dorsal wing.
    Trapezoid, base slightly rounded, *L. pulcher.*
    Elliptical or obovate, base rounded. *L. generosus.*

Post-dorsal wing low or wanting.	
Shell oval, rather solid,	*L. jenkinsianus.*
Elliptical or subrhomboid.	
Solid smoky brown,	*L. consobrinus.*
Subsolid, shining, often banded.	*L. marginalis; canefrianus; thwaitesii; corrianus.*
Thin, dark.	*L. lamellatus.*
Long rhomboid, black,	*L. scutum.*
Cuneate,	*L. narainporensis.*
Elongate ovate,	*L. nongyangensis; phenchooganjensis.*

Subgenus LAMELLIDENS s. s.

Shell dark colored; teeth well developed.

LAMELLIDENS MARGINALIS (Lamarck).

Shell subrhomboid or subelliptical, thin or subsolid, convex, inequilateral; beaks but slightly inflated, not greatly elevated, their sculpture consisting of subradial curved bars, the inner of which coalesce below; sometimes the bars are slightly zigzag; surface nearly smooth; posterior ridge rounded, ending in a blunt point on or below the median line; epidermis usually polished, sometimes showing faint wrinkles arranged in radial series, brownish or yellowish-brown, marked with one or more yellowish-tawny or straw-colored concentric bands; on the dorsal slope there are two elevated, radial threads and often faint, greenish rays; teeth delicate and lamellar, pseudocardinals two in each valve, placed opposite each other in the right; anterior and posterior muscle scars shallow, nacre bluish to salmon, generally soft and brilliant.

Length 85, height 45, diam. 26 mm.

Length 110, height 56, diam. 35 mm.

India; Burma; Pegu; Ceylon; Canton River, China? I believe that Mousson's *U. evanescens* is *L. marginalis,* but can it be from Java?

Die breite Mahler-Muschel aus Grönland, SCHRÖTER, Flussc., 1779, p. 181, pl. IX, fig. 1.

? Unio grœnlandica MÖRCH, Am. Jl. Conch., IV, 1868, p. 38.

?*Unio testudinarius* SPENGLER, Skriv. Selsk. Nat., III, 1793, 65.

?*Unio truncatus* SPENGLER, Skriv. Selsk. Nat., III, 1793, p. 65.

Unio marginalis LAMARCK, An. sans Vert., VI, 1819, p. 79.—DESHAYES, Enc. Meth. II, 1827, p. 151, pl. CCXLVII, fig. 1.—HANLEY, Biv. Shells, 1843, p. 206, pl. XX, fig. 53.—KUSTER, Conch. Cab. Unio, 1861, p. 239, pl. LXXX, fig. 4.—SOWERBY, Conch. Icon., XVI, 1867, pl. LIX, fig. 297.—HANLEY and THEOBALD, Conch. Ind., 1876, p. 20, pl. XLIII, fig. 2.

Margarita (Unio) marginalis LEA, Syn., 1836, p. 37; 1838, p. 24.

Margaron (Unio) marginalis LEA, Syn., 1852, p. 38; 1870, p. 60.

Lamellidens marginalis SIMPSON, Syn., 1900, p. 854.

Unio anodontina LAMARCK, An. sans Vert., VI, 1819, p. 80.

Unio anodontinus KUSTER, Conch. Cab. Unio, 1861, p. 240, pl. LXXX, fig. 15.

Symphynota bilineata LEA, Tr. Am. Phil. Soc., IV, 1831, p. 98, pl. XI, fig. 19; Obs., I, 1834, p. 108, pl. XI, fig. 19.

Margarita (Unio) bilineatus LEA, Syn., 1836, p. 38; 1838, p. 25.

Unio bilineatus HANLEY, Biv. Shells, 1843, p. 207, pl. XXI, fig. 30.—SOWERBY, Conch. Ieon., XVI, 1868, pl. LXXI, fig. 365.

Margaron (Unio) bilineatus LEA, Syn., 1852, p. 38; 1870, p. 61.

?*Unio evanescens* MOUSSON, Moll. Java, 1849, p. 91, pl. XVII, fig. 2.

Unio dolichorhynchus TAPPERONE CANEFRI, Am. Mus. Civ. Gen., 1889, p. 348.

Unio gianelli TAPPERONE CANEFRI, Am. Mus. Civ. Gen., 1889, p. 353.

I use Lamarck's name for this species because the *U. testudinarius* and *truncatus* were only briefly and imperfectly described, and never figured, their habitats being given as Greenland. Lamarck refers to the figures in Enc. Meth., pl. 247, figs. 1, 1*a*, 1*b*, 1*c*, which very accurately represent the shell we know as *Unio marginalis*.

An exceedingly variable species and I have only attempted to give a description of fairly typical forms as understood by Hanley and Theobald and Lea. The form is usually nearly elliptical, though sometimes slightly rhomboid as described by Lamarck, the younger shells are smooth and polished, while older ones are often somewhat rough.

Var. *obesus* (Hanley and Theobald).

A giant form, which does not exhibit any banding and is much swollen. The surface is dark brown or blackish.

Length 127, height 69, diam. 45 mm.

Unio marginalis var. *obesa* HANLEY and THEOBALD, Conch. Ind., 1876, p. 20, pl. XLIII, fig. 3.

Lamellidens marginalis var. *obesus* SIMPSON, Syn., 1900, p. 855.

?*Unio corrianus* SOWERBY, Conch. Icon., XVI, 1868, pl. LXXVII, fig. 401.

Var. *tricolor* (Kuster).

Shell fulvous with a broad outer yellowish band, the dorsal slope greenish with darker rays.

Unio tricolor KUSTER, Conch. Cab. Unio, 1856, p. 156, pl. XLV, fig. 1.

Unio marginalis var. *tricolor* HANLEY and THEOBALD, Conch. Ind., 1876, p. 20, pl. XLII, fig. 5.

Lamellidens marginalis var. *tricolor* SIMPSON, Syn., 1900, p. 855.

It is doubtful whether this is worthy of a varietal name.

Var. *candaharicus* (Hanley and Theobald).

Shell rhomboid, the dorsal and ventral outlines nearly straight and parallel; ashy brown, green on the dorsal slope.

Unio marginalis var. *candaharica* HANLEY and THEOBALD, Conch. Ind., 1870, p. 20, pl. XLIII, fig. 4.

Lamellidens marginalis var. *candaharicus* SIMPSON, Syn., 1900. p. 855.

Var. *cylindricus* (Hanley and Theobald).

Very much elongated, dorsal and ventral outlines nearly straight and parallel; posterior end pointed about on the median line; color brownish.

Length 108, height 48, diam. 30 mm.

Unio marginalis var. *cylindrica* HANLEY and THEOBALD, Conch. Ind., 1876, p. 20, pl. XLIV, fig. 1.

Lamellidens marginalis var. *cylindricus* SIMPSON, Syn., 1900, p. 855.

Var. *hanleyi* Simpson.

Shell long rhomboidal; beaks elevated; posterior ridge elevated, rounded; epidermis brownish with a yellowish border. This may possibly be a distinct species. The beaks appear to be more elevated than they are in any other of the forms. Hanley and Theobald believed it to be the *Unio corrianus* of Lea, but it is not that species at all.

Unio marginalis var. *corriana* HANLEY and THEOBALD, Conch. Ind., 1876, p. 20, pl. XLIV, fig. 4.

Lamellidens marginalis var. *hanleyi* SIMPSON, Syn., 1900, p. 855.

Var. *exanthematicus* (Kuster).

This seems to be a small form with a bright yellow epidermis and may be merely a young specimen.

Unio exanthematicus KUSTER, Conch. Cab. Unio, 1861, p. 243, pl. LXXXI, fig. 2.

Lamellidens exanthematicus SIMPSON, Syn., 1900, p. 856.

Pressidens exanthematicus HAAS, Conch. Cab., Unio, 1912, pl. 23, figs. 6-8.

Var. *sublamellatus* Preston.

"An elongate, somewhat rostrate form, having the hinge teeth rather less developed." (Preston).

Type locality, Burma.

Lamellidens marginalis var. *sublamellatus* PRESTON, Rec. Ind. Mus., VII, 1912, p. 305.

Var. *sawaddyensis* Preston.

"Shell much more ovate and convex than the typical form, having the dorsal margin more arched and posteriorly ascending, the ventral margin and anterior side more rounded, and the posterior side produced and roundedly rosrate." (Preston).

Type locality, Sawaddy River; also Bhamo; Sawaddy, Tengling Stream; Shuaygoomya, Upper Burma; Mandalay, Upper Burma.

Lamellidens marginalis var. *sawaddyensis* PRESTON, Rec. Ind. Mus., VII, 1912, p. 305.

LAMELLIDENS BURMANUS n. n.

Shell trapezoid, rhomboid, narrowed in front, scarcely subsolid, convex, inequilateral; beaks low; posterior ridge semi-double, faintly biangulate, ending near the base in a biangulation; dorsal and basal outlines curved; anterior end rounded; dorsal slope obliquely truncate, joining the dorsal line with a blunt angle; surface irregularly, concentrically striate; epidermis brown, shaded with green and yellowish; teeth compressed; laterals and often the pseudocardinals curved, the two sets widely separated; nacre bluish, orange-tinted in the cavities.

Length 72, height 44, diam. 21 mm.

Houngdaran, Burma.

Unio pulcher TAPPERONE-CANEFRI, Ann. Mus. Civ., VII, 1889, p. 350.—HAAS, Conch. Cab., Unio, pl. 33, figs. 7-8.

Lamellidens pulcher SIMPSON, Syn., 1900, p. 856.

More decidedly rhomboid than any specimens of *marginalis* I have seen, more narrowed in front and shorter in proportion to height. The National Museum possesses two specimens from Fea that I believe are authentic.

Haas, (l. c.), considers this a synonym of *Physunio micropterus*.

LAMELLIDENS BURMANUS n. n.

Shell slightly obovate, or elliptical, subinflated, inequilateral, rather thin; beaks moderately full; posterior ridge narrowly rounded, ending in a point about on the median line; anterior end rounded; dorsal slope slightly, obliquely truncate; surface nearly smooth; epidermis rich chestnut-brown, with narrow or wide zones of yellowish, shining; pseudocardinals compressed;

laterals remote; muscle scars rounded and shallow; nacre salmon-tinted, iridescent.

Length 70, height 39, diam. 22 mm.

Ceylon.

Unio thwaitesii LEA, Pr. Ac. N. Sci. Phila., III, 1859, p. 152; Jl. Ac. N. Sci. Phila., IV, 1860, p. 246, pl. XXXVII, fig. 125; Obs., VII, 1860, p. 64, pl. XXXVII, fig. 125.—REEVE, Conch. Icon., XVI, 1865, pl. XXIII, fig. 105.

Margaron (Unio) thwaitesii LEA, Syn., 1870, p. 41.

Lamellidens thwaitesii SIMPSON, Syn., 1900, p. 856.

Lamellidens marginalis var. *thwaitesi* PRESTON, Rec. Ind. Mus. VII, 1912, p. 303.

Unio consobrinus HANLEY and THEOBALD, Conch. Ind., 1876, p. 19, pl. XLI, fig. 7.

Very close to *consobrinus* and it is quite probable that the two run together. It seems to be rather less solid than that species, is more conspicuously banded, more brilliant, and has a salmon-tinted nacre.

LAMELLIDENS CONSOBRINUS (Lea).

Shell irregularly long elliptical or subrhomboid, rather solid, inequilateral; beaks somewhat full and elevated; posterior ridge high, narrowly rounded, ending in a blunt point below the median line; anterior end rounded below, angled above; dorsal slope obliquely subtruncate; surface nearly smooth, covered with a dull chestnut epidermis having a faint, broad, greenish border; teeth strong, compressed; laterals remote; muscle scars impressed; nacre bluish-white, tinted flesh-color in the cavities.

Length 60, height 33, diam. 21 mm.

Length 65, height 38, diam. 25 mm.

China; India; Ceylon.

Unio consobrinus LEA, Pr. Ac. N. Sci. Phila., III, 1859, p. 331; Jl. Ac. N. Sci. Phila., 1860, p. 272, pl. XLV, fig. 152; Obs., VII, 1860, p. 90, pl. XLV, fig. 152.

Margaron (Unio) consobrinus LEA, Syn., 1870, p. 46.

Lamellidens marginalis var. *consobrinus* PRESTON, Rec. Ind. Mus., VII, 1912, p. 304.

Unio corbeti Deschamps, Bull. Soc. Zool. Fr., XVII, 1892, p. 68, fig.

Unio mainwaringi Simpson, Syn., 1900, p. 856.

Lamellidens mainwaringi Preston, Rec. Ind. Mus., VII, 1912, p. 306.

More solid, less brilliant and more rhomboid than *L. thwaitesii* to which it is dangerously close. The type, whose measurements I have given first, has been slightly injured on the dorsal slope.

Shells have several times been received bearing the name *Unio mainwaringi* Nevill, which seem to be the same as *consobrinus* or merely a small form of it. I cannot find that Nevill ever described the species credited to him.

Since the publication of the Synopsis, Preston, (l. c.), has published a description of Nevill's species as follows:

"Shell rather small, cuneate, covered with a finely laminiferous periostracum; both valves marked with rather fine, concentric and finer, transverse, radiate, scratch-like striæ; dorsal margin anteriorly gradually sloping, posteriorly arched and more rapidly descending; ventral margin somewhat straight; anterior side rounded; posterior side angled above and below, somewhat obliquely and obtusely rostrate; hinge-teeth well developed, moderately short; anterior adductor scar deeply impressed, posterior scar somewhat roughly triangular, well impressed; interior of shell bluish, iridescent, rather granulate.

Long. 25.5, lat. 50 mm." (Preston).

Type locality, Siliguri; also Namtsik Dihang.

Lamellidens lamellatus (Lea).

Shell irregularly elleptical or subrhomboid, subinflated, rather thin, inequilateral; beaks moderately full and elevated, their sculpture being the characteristic, curved, subradial bars; posterior ridge elevated, narrowly rounded, there sometimes being one or two faint, radial ridges above it; dorsal slope obliquely subtruncate; dorsal outline nearly straight; surface almost smooth; epidermis olive to olive-chestnut; usually with a smoky tint, more or less shining; teeth much compressed;

laterals nearly or quite straight; muscle scars shallow; nacre bluish, sometimes deep blue.

Length 77, height 45, diam. 23 mm.

Length 70, height 36, diam. 25 mm.

India; Ceylon.

Unio lamellatus LEA, Tr. Am. Phil. Soc., VI, 1838, p. 19, pl. VI, fig. 16; Obs., II, 1838, p. 19, pl. VI, fig. 16.—HANLEY, Biv. Shells, 1843, p. 194, pl. XXI, fig. 49.—CHENU, Ill. Conch., 1858, pl. XXII, figs. 3, 3*a*, 3*b*.—SOWERBY, Conch. Icon., XVI, 1866, pl. LII, fig. 272.—HANLEY and THEOBALD, Conch. Ind., 1876, p. 21, pl. XLIV, fig. 7.

Margarita (Unio) lamellatus LEA, Syn., 1836, p. 26; 1838, p. 20.

Margaron (Unio) lamellatus LEA, Syn., 1852, p. 29; 1870, p. 46.

Lamellidens lamellatus SIMPSON, Syn., 1900, p. 856.

Lamellidens marginalis var. *lamellatus* PRESTON, Rec. Ind. Mus., VII, 1912, p. 304.

Unio layardii LEA, Pr. Ac. N. Sci. Phila., III, 1859, p. 153; Jl. Ac. N. Sci. Phila., IV, 1860, p. 243, pl. XXXVI, fig. 122; Obs., VII, 1860, p. 61, pl. XXXVI, fig. 122.—REEVE, Conch. Icon., XVI, 1856, pl. XXIII, fig. 111.—HANLEY and THEOBALD, Conch. Ind., 1876, p. 19, pl. XLI, fig. 1.

Margaron (Unio) layardii LEA, Syn., 1870, p. 46.

The shell is generally rather thin, the epidermis is almost always smoky, and is occasionally bordered by a lighter band. The type is not in the Lea collection.

LAMELLIDENS SCUTUM (Sowerby).

Shell elongated, rhomboid, subinflated, inequilateral, with dorsal and basal lines straight and parallel; dorsal slope obliquely subtruncate; posterior ridge widely double, ending in a wide biangulation below the median line; beaks apparently not much elevated; surface smooth, of a uniform pitch color; teeth compressed; pseudocardinals slanting; laterals remote; nacre livid whitish.

Length 100, height 50 mm.

Tenasserim.

Unio scutum SOWERBY, Conch. Icon., XVI, 1868, pl. XCIV, fig. 510.—HANLEY and THEOBALD, Conch. Ind., 1876, p. 22, pl. XLVI, fig. 1.

Lamellidens scutum SIMPSON, Syn., 1900, p. 857.

Lamellidens marginalis var. *scutum* PRESTON, Rec. Ind. Mus., VII, 1912, p. 304.

A much elongated rhomboid species, the dorsal and basal outlines being nearly straight and parallel. According to Sowerby the epidermis is pitch color.

Var. *humilior* (von Martens).

"Somewhat lower, but on the whole agreeing well with the typical form; young shells of a lively brownish-green, older ones blackish. Basal margin nearly straight in young shells, slightly incurved in mature ones. Posterior ridge well marked near the umbones. Teeth tubercular, but proportionally small.

Length 124, height at beaks 49, at postero-dorsal angle 56, diam. 26 mm. Beaks situated at 2/9 of the length, postero-dorsal angle at 2/3 of the length." (von Martens).

Type locality, Chindwin River near Kalewa, Upper Burmah and its tributary, the Yu River.

Unio scutum var. *humilior* von MARTENS, Arch. für Naturg., I, 1899, p. 45, pl. v, fig. 1.

"The younger specimens of this form have a great likeness in their outer appearance to *U. marginalis* var. *anodontinus* of the Conch. Ind., pl. 42, fig. 7, but they should have thinner teeth to belong to *marginalis*."

LAMELLIDENS CORRIANUS (Lea).

Shell irregularly long elliptical, thin, convex, inequilateral; beaks low; posterior ridge but slightly elevated, rounded, ending in a blunt point about on the median line; dorsal outline straight or nearly so; dorsal slope obliquely truncated; anterior end a little narrowed, rounded, slightly cut away below; surface nearly smooth; epidermis ashy-olive, with radial rows of very delicate wrinkles on the anterior end, brilliantly polished and having a somewhat metallic luster; teeth very delicate, compressed; laterals straight; nacre bluish, iridescent.

Length 54, height 26, diam. 14 mm.

India; Burma; Pegu.

Unio corrianus LEA, Tr. Am. Phil. Soc., VI, 1834, p. 65, pl. IX, fig. 25; Obs., I, 1834, p. 177, pl. IX, fig. 25.—HANLEY, Biv. Shells, 1843, p. 207, pl. XX, fig. 60.

Margarita (Unio) corrianus LEA, Syn., 1836, p. 38; 1838, p. 25.

Margaron (Unio) corrianus LEA, Syn., 1852, p. 38; 1870, p. 61.

Lamellidens corrianus SIMPSON, Syn., 1900, p. 857.

Lamellidens marginalis var. *corrianus* PRESTON, Rec. Ind. Mus., VII, 1912, p. 304.

A very delicate, highly polished species, the epidermis having a somewhat metallic or bronzy luster.

LAMELLIDENS GENEROSUS (Gould).

Shell irregularly elliptical or somewhat obovate, rather thin, convex or subcompressed, inequilateral; narrowed and rounded in front; posterior ridge rounded, ending in a rounded point at or below the median line; dorsal outline slightly arched; dorsal slope obliquely truncate, its outline straight or incurved, meeting the dorsal line at an angle; base line rounded, especially full behind the middle; surface more or less concentrically sculptured; epidermis dark chestnut or blackish, reddish in the umbonal region, shining; teeth lamellar; laterals remote and elevated; nacre bluish, sometimes salmon in the cavities.

Length 91, height 58, diam. 27 mm.

Burma; Pegu.

Unio generosus GOULD, Pr. Bost. S. N. Hist., II, 1847, p. 220. —HANLEY and THEOBALD, Conch. Ind., 1876, p. 22, pl. XLVI, fig. 4.

Margaron (Unio) generosus LEA, Syn., 1870, p. 29.

Lamellidens generosus SIMPSON, Syn., 1900, p. 857.

Lamellidens marginalis var. *generosus* PRESTON, Rec. Ind. Mus., VII, 1912, p. 304.

?*Unio lamellatus* SOWERBY, Conch. Icon., XVI, 1868, pl. XCIV, fig. 511.

Unio thwaitesii HANLEY and THEOBALD, Conch. Ind., 1876, p. 20, pl. XLIII, fig. 1.

A fine matched pair with the label *U. generosus* Gould, is in the Lea collection, presented by Dr. Gould from Newville, British Burma. It has a rather well-developed post-dorsal wing and shows decided, concentric sculpture.

LAMELLIDENS CANEFRIANUS Simpson.

Shell somewhat obovate, convex, rather thin, inequilateral; beaks compressed, their sculpture consisting of delicate, curved, radial ridges, which are subnodulous and inclined to break up into zigzags; posterior ridge low, rounded; there are two delicate, pinched-up ridges above on the dorsal slope, which fade out below, anterior end somewhat narrowed, rounded; posterior end bluntly pointed above the median line; dorsal slope obliquely truncate; dorsal and basal outlines lightly curved, the latter quite full behind the middle; surface with fine, concentric striæ with excessively fine, radial, microscopic lines in front, very faintly granular on the disk; epidermis brilliant yellowish-green, smoky-tinted green on the dorsal slope; teeth delicate, compressed; nacre whitish.

Length 89, height 44, diam. 27 mm.

Prome, Lower Burma.

Unio protensus TAPPERONE-CANEFRI, Am. Mus. Civ. Gen., VII, 1889, p. 349.

Lamellidens canefrianus SIMPSON, Syn., 1900, p. 857.

I am very doubtful whether this is anything but a variety of *marginalis*. Several specimens from Fea, of the type lot, are before me, none of them quite grown, but they are all in beautiful condition, and show the character of the beaks and surface perfectly. The shell is shorter in proportion than most *marginalis*, and is much produced on the post-basal region. The name *protensus* was used by Lea in 1865 for a North Carolina *Unio*, hence I have changed it as above.

LAMELLIDENS JENKINSIANUS (Benson).

Shell somewhat solid, subinflated, irregularly long oval; inequilateral; beaks full and high; anterior end subangulate above, rounded below; base line nearly straight; dorsal, outline arched; post-dorsal slope slopingly subtruncate; surface with strong concentric striæ; epidermis brownish; pseudocardinals and laterals rather solid; muscle scars impressed; nacre bluish-white.

Length 94, height 51 mm.

Assam.

Unio jenkinsianus BENSON, Ann. and Mag., X, 1862, p. 185. —HANLEY and THEOBALD, Conch. Ind., 1876, p. 19, pl. XLI, fig. 4.

Lamellidens jenkinsianus SIMPSON, Syn., 1900, p. 857.

Lamellidens marginalis var. *jenkinsianus* PRESTON, Rec. Ind. Mus., VII, 1912, p. 305.

I am at a loss to know what this is. Hanley and Theobald think it may probably be considered an abnormal form of *U. marginalis* or *corrianus*. It certainly cannot be the latter but may possibly be the former. The figure bears some resemblance to that of an old *Unio buckleyi*. There is a shell in the National Museum collection, which I refer to this with considerable doubt, but it is not so solid as the figure given by Hanley and Theobald show *jenkinsianus* to be.

LAMELLIDENS NARAINPORENSIS Preston.

"Shell cuneate, moderately convex, posteriorly rostrate, dark reddish-brown, covered, towards the margins, with a finely laminiferous periostracum, marked with concentric lines of growth, bearing two carinæ on each valve running from the umbones in a dorsally posterior direction; umbones small, not prominent, somewhat coarsely corrugated; dorsal margin very gently arched; ventral margin scarcely rounded in the anterior and median regions, slightly curved posteriorly; anterior side abruptly rounded; posterior side sloping above, then angled and very abruptly descending; cardinal tooth in left valve obtrusely triangular, erect, absent in the right valve; lateral teeth anteriorly short, deeply grooved and projecting in the right valve, erect and jagged in the left, posteriorly moderately elongate and bifurcated in both valves; anterior scars rather circular, deep; posterior scars lightly impressed; interior of shell pale flesh-color shading to iridescent bluish-white, very minutely granulate.

Long. 35, lat. 84 mm." (Preston).

Type locality, Narainpore Bhil, Murshidabad District, Bengal.

Lamellidens narainporensis PRESTON, Rec. Ind. Mus., VII, 1912, p. 306.

LAMELLIDENS NONGYANGENSIS Preston.

"Shell very elongately ovate, inflated, covered with a blackish-brown, finely laminiferous periostracum, concentrically marked with rather coarse lines of growth; dorsal margin anteriorly somewhat straight, posteriorly arched above, sloping and slightly excavated below; ventral margin scarcely rounded; anterior side abruptly descending; posterior side rostrate, obtusely rounded; cardinal teeth very anteriorly situate, triangular, erect; lateral teeth elongate, also erect, terminating posteriorly in an abrupt slope; anterior scars deeply marked; posterior scars lightly impressed; interior of shell flesh-colored shading to bluish, iridescent, minutely pitted and granulate.

Long. 45, lat. 94 mm." (Preston).

Type locality, Nongyang Lake, South of Patkai.

Lamellidens nongyangensis PRESTON, Rec. Ind. Mus., VII, 1912, p. 306.

LAMELLIDENS PHENCHOOGANJENSIS Preston.

"Shell very elongately ovate, posteriorly obtusely rostrate, dark blackish-brown, sculptured with fine, concentric striæ, crossed, especially in the anterior median region, by fine, slightly distant, transverse, radiate striæ, thus presenting a minutely wrinkled appearance; umbones flattened, much eroded; dorsal margin anteriorly gently sloping, posteriorly more rapidly sloping in a slight curve; ventral margin scarcely rounded; anterior side angled above, gently rounded below; posterior side produced, angularly rounded; hinge teeth very elongate, somewhat fine; anterior scars ovate, moderately impressed; posterior scars roughly triangular, not well impressed; interior of shell shading from pale brown to bluish, nacreous, marked, especially towards the anterior ventral region, with very shallow, radiate furrows.

Long. 42, lat. 86 mm." (Preston).

Type locality, Phenchooganj, Central Sylhet.

Lamellidens phenchooganjensis PRESTON, Rec. Ind. Mus., VII, 1912, p. 306.

Subgenus SPATHOPSIS Simpson. 1900.

Spathopsis SIMPSON, Syn., 1900, p. 857.

Shell long, elliptical, compressed, beaks rather low, said to bear concentrically roughened ridges, with slight plications in front and behind them; posterior ridge not developed; surface shining, smooth; hinge line narrow, with faint, greatly elongated pseudocardinals and laterals; escutcheon deep, triangular; beak cavities shallow; anterior muscle scars elongated; posterior faint; iridescent behind.

Type, *Anodonta guillaini* Recluz.

LAMELLIDENS GUILLAINI (Recluz).

Shell elongated, almost evenly elliptical, convex, subsolid; beaks not greatly elevated, sharp, turned forward; rugosely concentrically grooved; posterior ridge low and widely rounded; surface with delicate, concentric sculpture; epidermis pale reddish-brown, lighter at the umbonal region; muscle scars complicated; nacre flesh-colored, slightly iridescent.

Length 120, height 56, diam. 27 mm.

Denog River, Brava, Northeast Africa.

Anodonta guillaini RECLUZ, Jl. de Conch., I, 1850, p. 55.—CROSSE, J. de Conch., XXXI, 1883, p. 222, pl. IX, fig. 4.

Lamellidens guillaini SIMPSON, Syn., 1900, p. 858.

Spatha guillaini GERMAIN, Arch. Zool. Exp. et Gen., (5), I, 1909, p. 56.

The description given of this species is not at all full. The excellent figure cited shows delicate lamellar pseudocardinals and laterals and if it is correct this species belongs to the Unionidae and it is not related to the *Spatha rubens* with which the author compares it.

Genus TRAPEZOIDEUS Simpson. 1900.

Trapezoideus Simpson, Syn., 1900, p. 858.

Shell trapezoid, much compressed, with a low posterior ridge, and but slightly raised, though pointed, beaks, which seem to be sculptured with irregularly radial ridges arranged in two imperfect chevron-shaped loops; surface concentrically sculptured, often having irregular radial ridges on the posterior slope; epidermis yellowish-green or brownish, with two or more green rays above the posterior ridge; teeth compressed; two pseudocardinals in the left valve, one under the beak, the other in front, often not well separated, and two laterals; right valve with two pseudocardinals and one lateral; pseudocardinals all irregular, often pitted and peculiarly dentilate; laterals granular, showing traces of vertical striation; cavity of the beaks rather deep, compressed; muscle scars shallow, anterior scars separate; nacre soft, creamy, yellowish in the beak cavities.

Animal unknown.

Type, *Unio foliacea* Gould.

The species which I have placed in this group have generally elongated, rhomboid or trapezoid, rather thin, subcompressed shells. The beaks are but slightly elevated and nothing is known of their sculpture so far as I know. The surface has well-marked, concentric sculpture, which is sometimes corrugated, the teeth are compressed and roughened, the pseudocardinals being usually rather feeble. The group does not seem to be very close to any other.

Key to species of Trapezoideus.

Shell with dark epidermis and nacre.	
Long rhomboid.	*T. exolescens.*
Ovate elliptical.	*T. ludovicianus.*
Shell with light epidermis and nacre.	
Trapezoid.	*T. pallegoixi.*
Obovate rhomboid.	*T. theca; peninsularis.*
Rhomboid.	
Not arcuate.	*T. foliaceus.*
Subarcuate.	*T. miscellus.*

TRAPEZOIDEUS FOLIACEUS (Gould).

Shell long rhomboid, a little narrower in front, subsolid, subcompressed or convex, inequilateral; posterior ridge feebly double, there being often a third, faint ridge on the posterior slope; dorsal outline lightly arched; posterior end obliquely truncate above, somewhat biangulate below; base line straight or a little incurved; anterior end rounded; surface densely, finely, concentrically sculptured; beaks apparently low; epidermis yellowish-green or yellowish-olive, in old shells usually faintly clouded or widely rayed with green behind; there are two irregular, compressed, much-striated pseudocardinals in each valve and two remote laterals in the left valve and one in the right; beak cavities compressed but not deep; muscle scars irregular; nacre bluish-white, salmon-tinted in the cavities, of a soft, iridescent tint.

Length 62, height 34, diam. 18 mm.

Burma; Cambodia.

Unio foliacea GOULD, Pr. Bost. Soc. N. Hist., I, 1843, p. 141.

Unio foliaceus HANLEY and THEOBALD, Conch. Ind., 1876, p. 19, pl. XLII, fig. 3.—ANDERSON, Yunnan Exp., 1877, p. 900, pl. LXXX, figs. 8-12.

Margaron (Unio) foliaceus LEA, Syn., 1852, p. 39; 1870, p. 62.

Trapezoideus foliaceus SIMPSON, Syn., 1900, p. 858.—HAAS, Conch. Cab., Unio, 1912, pl. 32, figs. 3-4.

Unio peguensis ANTHONY, Am. Jl. Conch., I, 1865, p. 351, pl. XXV, fig. 2.—SOWERBY, Conch. Icon., XVI, 1868, pl. XCV, fig. 519.

Margaron (Unio) peguensis LEA, Syn., 1870, p. 51.

I am not positive that Gould's *Unio foliaceus* is the young of Anthony's *U. peguensis* as Hanley and Theobald are, but I am very strongly inclined to believe it. I have before me two specimens from the Lea collection labeled *Unio foliaceus* by Gould and presented by him to Dr. Lea.

They are rather thinner than any specimens I have seen of *U. peguensis* Anthony, and are not quite so strongly sculptured, but they are smaller than any *peguensis* in the National

Museum. Gould's shells are slightly plicate on the dorsal slope, but this character is occasionally present even in adult *peguensis.*

Var. *comptus* (Deshayes and Julien).

Shell small, more inflated than the type, rather thin.

Length 32, height 18, diam. 10 mm.

Unio comptus Deshayes and Julien, Arch. de Mus., X, 1874, p. 126, pl. vi, figs. 3, 4.—Haas, Conch. Cab., Unio, 1912, pl. 33, fig. 2.

Trapezoideus foliaceus var. *comptus* Simpson, Syn., 1900, p. 858.

Unio fragilis Nevill, Jl. As. Soc. Beng., XLVI, 1877, p. 39.—Anderson, Yunnan Exp., 1877, p. 400, pl. lxxx, figs. 8-12.

The figure by Deshayes and Julien shows quite a little plication on the dorsal slope. I have before me a specimen of *Unio fragilis Nevill*, an author's specimen, which is a little smoother on the dorsal slope, but does not appear to differ otherwise.

Haas, (l. c.), considers this a synonym of *misellus.*

Var. *zayleymanensis* Preston.

"Shell thinner and smaller than the typical form, more produced anteriorly and much more obtuse posteriorly; the slight curve in the ventral margin is also absent." (Preston).

Type locality Bhamo; also Zayleyman.

Trapezoideus foliaceus var. *zayleymanensis,* Preston, Rec. Ind. Mus., VII, 1912, p. 307.

Trapezoideus foliaceus var. *zayleiwanensis* Haas, Conch. Cab., Unio, 1912, pl. 33, fig. 1.

Haas, (l. c.), considers this a synonym of *T. misellus.*

Trapezoideus misellus (Morelet).

Shell elongated, subarcuately rhomboid, thin, compressed, inequilateral; umbonal region somewhat elevated; beaks rather sharp; posterior ridge full, feebly biangulate, ending behind in a faint biangulation at and below the median line; anterior end narrowly rounded above, cut away below; base line incurved in the middle; dorsal outline lightly arched; dorsal slope obliquely truncate; surface rudely and unevenly concentrically sculptured; dorsal slope feebly plicate; epidermis dirty greenish; teeth delicate, lamellar; laterals remote; nacre bluish, salmon-tinted in the cavities.

Length 60, height 27, diam. 12 mm.
Length 61, height 28, diam. 16 mm.
Siam.

Unio misellus MORELET, Jl. de Conch., XIII, 1865, p. 21; Ser. Conch., IV, 1875, p. 341, pl. XIV, fig. 2.—VON MARTENS, Arch. für Naturg, I, 1899, p. 43, pl. VI, figs. 4-8.

Trapezoideus misellus SIMPSON, Syn., 1900, p. 859.—HAAS, Conch. Cab., Unio, 1912, pl. 32, figs. 6-9.

Unio siamensis LEA, Pr. Ac. N. Sci. Phila., X, 1866, p. 133; Jl. Ac. N. Sci. Phila., VI, 1868, p. 279, pl. XXXVIII, fig. 93; Obs., XII, 1869, p. 39, pl. XXXVIII, fig. 93.

Margaron (Unio) siamensis LEA, Syn., 1870, p. 57.

I have before me the type of Lea's *Unio siamensis,* which does not seem to differ in any particular from *Unio misellus* as described and figured by Morelet, unless it may be a little more compressed. Morelet's measurements, given in the "Series Conchyliologiques," make his species somewhat inflated and may be incorrect. These are: length 66, height 31, diam. 21 mm. The second measurements I have given are those of his type.

Var. *subclathratus* (von Martens).

"Differs mainly from the typical form by the folds, which descend from the umbones, but do not reach the basal margin in the centre of the disk; they are nearly vertical and more or less regularly interrupted by the growth-lines and therefore have a granulated appearance, sometimes, particularly near the beaks, they also meet at acute angles pointed downwards, but this is the exception rather than the rule. At both extremities they radiate obliquely, without a noticeable curve and without granulations; posteriorly they frequently fork and anteriorly often meet at irregular acute angles. The general form and coloring, as a whole, is like typical *misellus,* but on the average the shell is less thin, somewhat more inflated, the basal margin straight or even somewhat convex, frequently there is a beautifull dark green ray on the forward part of the posterior slope.

Length 45, height at beaks 23, at postero-dorsal angle 24, diam. 15 mm. Beaks situated at 1-3 of the length." (von Martens).

Type locality, Chindwin River near Kalewa and Matu and in the Irriwadi near Yenangyoung, Burmah.

Unio miscellus var. *subclathratus* VON MARTENS, Arch. für Naturg., I, 1899, p. 44, pl. VI, fig. 3.

Trapezoideus subclathratus HAAS, Conch. Cab., Unio, 1912, pl. 33, fig. 6.

TRAPEZOIDEUS PALLEGOIXI (Sowerby).

Shell decidedly rhomboid or trapezoid, much wider behind than in front, compressed inequilateral; beaks rather full; posterior ridge prominent, narrowly rounded, ending near the base of the shell in a rounded point; dorsal line nearly straight; posterior and almost squarely truncate; anterior end narrowed, rounded above, cut away below; base line incurved in the middle; surface with well marked, concentric wrinkles, with a few nearly vertical, curved folds in front of the posterior ridge; epidermis greenish-yellow.

Length 70, height at beaks 28, at hinder end of ligament 35 mm.

Siam; Cambodia.

Anodon pallegoixi SOWERBY, Conch. Icon., XVII, 1867, pl. VIII, fig. 17.—HAAS, Conch. Cab. Unio, 1912, pl. 33, figs. 3-5.

Anodonta pallegoixi CLESSIN, Conch. Cab. Ano., 1876, p. 210, pl. LXIV, fig. 6.

Trapezoideus pallegoixi SIMPSON, Syn., 1900, p. 859.

Sowerby tells nothing of the teeth or nacre of this shell. It is probable that the teeth are lamellar and rather feebly developed. It is plainly a number of the *Trapezoideus* group of Uniones and differs from *foliaceus* and *miscellus* in the decidedly trapezoid form and in having nearly vertical curved plications in front of the posterior ridge.

Haas, (l. c.), considers this a synonym of *T. misellus.*

TRAPEZOIDEUS EXOLESCENS (Gould).

Shell long rhomboid, inequilateral, rather thin, subcompressed; anterior end rounded, narrowed; dorsal outline lightly arched; dorsal slope obliquely truncate; base line nearly straight; posterior ridge double, ending in a feeble biangulation near the base; surface with irregular, concentric sculpture, and in some cases faint plications on the dorsal slope; epidermis smoky-brown; pseudocardinals rather shorter than in most of the species, feebly developed; laterals remote, well developed; nacre bluish, lurid purplish in the cavities.

Length 69, height 32, diam. 17 mm.

Tavoy, Burma.

Unio exolescens GOULD, Pr. Bost. S. N. Hist., I, 1843, p. 141.—HANLEY and THEOBALD, Conch. Ind., 1876, p. 43, pl. CVII, fig. 5.

Margaron (Unio) exolescens LEA, Syn., 1852, p. 32; 1870, p. 51.

Trapezoideus exolescens SIMPSON, Syn., 1900, p. 859.

Four odd valves are in the Lea collection, presented by Dr. Gould under the name *Unio exolescens*. It is quite a distinct species, differing from others of the group in its dark epidermis, the color of its nacre and the shorter pseudocardinals.

TRAPEZOIDEUS THECA (Benson).

Shell rather small, scarcely subsolid, somewhat elongated, subrhomboid, quite inequilateral, beaks small but somewhat sharply elevated; anterior end narrowed, a little, rounded; base line a little inflated just behind the middle; dorsal outline nearly straight; outline of dorsal slope obliquely rounded; posterior ridge rounded; surface with rather strong concentric sculpture and slightly corrugated; dorsal slope plicate; epidermis yellowish; teeth delicate; pseudocardinals oblique; nacre bluish, reddish in the cavities, iridescent.

Length 40, height 21 mm.

Cane River, Bundelkhund, India.

Unio theca BENSON, Ann. and Mag., X, 1862, p. 186.—HANLEY and THEOBALD, Conch. Ind., 1876, p. 6, pl. XII, fig. 5.

Trapezoideus theca SIMPSON, Syn., 1900, p. 859.

I am not certain as to the systematic position of this species, which may belong here. It is a rather small, oblong, subrhomboid form with concentric sculpture, apparently somewhat corrugated and having a yellowish epidermis.

TRAPEZOIDEUS PENINSULARIS Simpson.

Shell subrhomboid, rather thin, inequilateral; beaks but slightly elevated; posterior ridge double, ending in a faint biangulation at and below the median line; dorsal slope obliquely truncate; anterior end narrowed and rounded, cut away a little below; base line curved; surface finely wrinkled and apparently concentrically sculptured; epidermis fulvous-yellow or fulvous-olive.

Length 39, height 23 mm.

Sumatra.

Unio sumatrensis SOWERBY, Conch. Icon., XVI, 1865, pl. XXVIII, fig. 142.

Trapezoideus peninsularis SIMPSON, Syn., 1900, p. 859.

I am not at all certain where this species should be placed, as Sowerby's description is very inadequate. It is shorter in proportion to height than the other species, and the base line is more rounded. This is not Lea's *sumatrensis,* nor that of Dunker. The name being preoccupied, I have changed it to *peninsularis.* I do not think it is the same as the *Unio comptus,* as Fischer believes.

TRAPEZOIDEUS LUDOVICIANUS (Rochebrune).

"Shell ovate elliptical, thick, moderately convex, brown; anterior region rounded; dorsal margin arcuate behind, abruptly truncated below; ventral margin subsinuous; surface deeply, concentrically sulcate, with minute, straight, interrupted grooves, which toward the dorsal margin and especially at the umbonal region develop into conspicuous, intricate waves; umbones obtuse, greatly eroded, coppery; cardinal tooth quadrate, thick, crenulate; lateral teeth elongate, distant in the right valve; interior nacreous, bluish, salmon under the beaks.

Length 50, height 32, diam. 22 mm." (Rochebrune).

Type locality, Preck-Scholl, Upper Mekong.

Diplodon ludovicianum Rochebrune, Bull. Soc. Phil., 1882, p. 43.—Simpson, Syn., 1900, p. 862.

Trapezoideus ludovicianus Haas, Conch. Cab. Unio, 1912, pl. 32, fig. 5.

This species, which was placed among the indeterminate species in the Synopsis, has recently been figured as a *Trapezoideus* by Haas, (l. c.), but the accompanying text has not yet been published.

Genus ARCONAIA Conrad, 1865.

Arconaia Conrad, Am. Jl. Conch., I, 1865, p. 234.

Shell greatly elongated, inflated, solid, twisted on its axis, sometimes straight, but generally having the posterior end curved strongly to the right or left, with a decided posterior ridge on both sides of the shell, ending in a blunt point, with generally a small ridge above on the post-slope; beaks rather low, sculpture not seen, but probably zigzag-radial; often a few nodulous or wavy ridges cross the body of the shell, which is irregularly sulcate; epidermis rayless; two pseudocardinals in the right valve, the upper compressed, separated from the split-up lower one by a parallel-sided pit, two in the left, and two heavy laterals; one lateral in the right and a vestige of one below it, laterals granulated and vertically striate; muscle scars deep, anterior small, the front and upper united, the hinder separate; posterior muscle scars long, oblique; beak cavities very shallow; dorsal scars numerous, placed just on the inner edge of the hinge; nacre white. The lobes of the mantle are not united into siphons, but separated throughout, with only a feeble commissure separating the anal and branchial openings.

Type, *Triquetra lanceolata* Lea.

In 1865 Conrad established the genus *Arconaia* for the *Triquetra lanceolata* of Lea. I have placed in it, besides the original form, two others which Heude doubtfully believes to be varieties of *lanceolata*, but which seem to me to be valid species. The systematic position of the group is a little uncertain, but I am inclined to believe that it is one of the Endobranchs and should be placed in the supergeneric group *Rosanorhamphus*.

Group of *Arconaia lanceolata.*

Shell with an anterior wing.

ARCONAIA LANCEOLATA (Lea).

Shell elongated, solid, subinflated, twisted on its axis, curved to the right or left from the middle to the extreme posterior end, with a strong anterior wing, which is carried forward to a point; posterior ridge well developed, subangular or narrowly rounded, fullest on the convex side of the shell, ending in a blunt point below an oblique posterior truncation; beaks but little elevated; surface with irregular growth lines, often with a few nodules or subvertical corrugations at the anterior of the disk; epidermis ashy brown, somewhat silky; pseudocardinals strong, double in each valve, usually much split up; laterals very long, more or less vertically striate, two in the left valve and one in the right; muscle scars well impressed, the posterior ones long and oblique; dorsal scars numerous; nacre whitish.

Length 130, height 34, diam. 22 mm.

China.

Triquetra lanceolata LEA, Pr. Ac. N. Sci. Phila., VIII, 1856, p. 79.

Hyria lanceolata LEA, Pr. Ac. N. Sci. Phila., 1856, p. 300.

Arconaia lanceolata CONRAD, Am. Jl. Conch., I, 1856, p. 234.—SIMPSON, Syn., 1900, p. 860.

Triquetra contorta LEA, Pr. Ac. N. Sci. Phila., VIII, 1856, p. 300; Obs., VI, 1857, p. 39, pl. XXXIII, fig. 33; Jl. Ac. N. Sci. Phila., III, 1858, p. 319, pl. XXXIII, fig. 33.

Hyria contorta SOWERBY, Conch. Icon., XVII, 1869, pl. I, figs. *2a*, *2b*.

Margaron (Triquetra) contorta LEA, Syn., 1870, p. 26.

Unio contortus HEUDE, Conch. Fluv. Nank., II, 1877, pl. XV., fig. 31.

Several examples of this remarkable shell are before me, most of which turn to the right behind; one, however, curves strongly to the left. One of the shells curves but little and there is quite a little variation in this matter, as well as in the amount of the twist. A young, or perhaps not fully adult shell, shows long anterior wings, 20 millimeters in length, drawn out to a point, but these are generally more or less broken away. The type is not in the Lea collection, but a smaller shell presented by Cunning.

ARCONAIA MUTICA (Heude).

Shell solid, inflated, elongated, twisted on its axis and having the hinder part bent to one side; beaks apparently low; anterior end with a short wing above; posterior ridge elevated, double and angled in the inner valve, the two ridges widely separated; posterior end widely, obliquely truncate; surface rather more roughened than in *lanceolata;* epidermis reddish-brown or blackish-brown, scarcely if at all sericeous; pseudocardinals strong, triangular, ragged but not split into denticles in the specimens seen; laterals vertically striate; muscle scars impressed, the posterior ones long and oblique; nacre flesh-colored.

Length 108, height 30, diam. 25 mm.

China.

Unio contortus var. *muticus* HEUDE, Conch. Fluv. Nank., II, 1877, pl. XV, fig. 32.

Arconaia mutica SIMPSON, Syn., 1900, p. 860.

Heude makes this a variety of *lanceolata,* but, although I have seen some intermediate material, I am inclined to believe it worthy of a specific rank. It is solider, more inflated and rougher than *lanceolata,* it is not so silky, the color is more reddish, the posterior ridge of what may be called the inner valve is widely and angularly double, the posterior end is obliquely truncate instead of being pointed as in *lanceolata.* The pseudocardinals are more solid and triangular, and not so much split.

Group of *Arconaia conjungens.*

Shell moderately solid, slightly twisted and bent, rounded in front; pseudocardinals not so much torn as in the *lanceolata* group; not winged in front.

ARCONAIA CONJUNGENS (Heude).

Shell somewhat delicate, elongated not very solid, but slightly curved or twisted; posterior ridge rather high and pinched up on the outer valve, ending in a point on the median line; anterior end almost regularly rounded, slightly angled, but wholely wanting a wing above; surface smooth; pseudocardinals subcompressed, rather short; laterals long and nearly straight; muscle scars impressed, the posterior ones long and oblique.

Length 80, height 21 mm.

China.

Unio contortus var. *conjungens* HEUDE, Conch. Fluv. Nank., II, 1877, pl. xv, fig. 33.

Arconaia conjungens SIMPSON, Syn., 1900, p. 860.

Heude also makes this a variety of *A. lanceolata,* but states that both his varieties are probably species. This is much more delicate than *lanceolata,* is smaller, smoother, less solid, less twisted and curved and has different pseudocardinals. His description is very meagre.

Genus PSEUDAVICULA Simpson, 1900.

Pseudavicula SIMPSON, Syn., 1900, p. 860.

Shell with a well-developed anterior and posterior dorsal wing; dorsal line strongly incurved; beaks full, not high; a high, down-curved posterior ridge runs to the posterior basal point, and between this point and the posterior point of the wing the outline is deeply incurved; base and lower part of anterior end rounded; surface slightly sculptured with concentric ridges; beak sculpture probably zigzag rayed; anterior tooth of left valve elongate, slightly corrugated, that of the right double; laterals in left valve double, single in the right, straight, elongated, thin, and prominent; nacre rose-tinted.

Animal unknown.

Type, *Unio johnstoni* Smith.

PSEUDAVICULA JOHNSTONI (Smith).

Shell irregularly rhomboid, compressed, rather thin, inequilateral; dorsal margin an inverted arch, the anterior and posterior ends of which extend into wings; beaks slightly elevated;

posterior ridge prominent, narrowly rounded, curved downward in the middle, ending in a produced point near the base of the shell; posterior end sharply incurved between the wing and the base; base rounded; anterior end rounded and cut away below; surface strongly, concentrically striate, highly corrugated at the umbones; epidermis pale green, obscurely radiate behind; nacre beautifully pearly, iridescent, pale rose color; pseudocardinals elongated, corrugated, single in the left valve, double in the right; laterals single in the right valve, double in the left.

Length 53, height 30, diam. 9.5 mm.

Lake Mweru, British Central Africa.

Unio (Metaptera) johnstoni Smith, Pr. Zool. Soc. Lond., 1893, p. 640, pl. lix, figs. 18-20.

Pseudavicula johnstoni Simpson, Syn., 1900, p. 861.

This remarkable species bears a striking resemblance to a *Prisodon* and is possibly closely related to that group. Smith states that the region above the umbones is lightly corrugated, but does not say whether this sculpture is zigzag-radial or otherwise. He states that the shell gapes slightly at both ends.

Genus ARCIDOPSIS Simpson, 1900.

Arcidopsis Simpson, Syn., 1900, p. 861.

Shell inequilateral, elongated, with dorsal and ventral lines nearly straight and parallel; anterior end strongly and obliquely truncated from the beaks to the anterior base, and ending in a rather sharp but rounded point below; posterior end obliquely truncated above, rounded below; posterior ridge full, rounded; the shell in front and below rather compressed; surface concentrically and radially ridged; pseudocardinals strong, two in the right valve, one in the left, and supported by a strong, cardinal rib; muscle scars well impressed; pallial line distinct.

Animal unknown.

Type, *Unio footei* Theobald.

Arcidopsis footei (Theobald).

Shell trapezoid, elongated, compressed, inequilateral; beaks prominent; dorsal line straight, posterior end obliquely truncate above, rather widely rounded below; base line straight; anterior end slightly narrowed, obliquely cut away from the beaks to near the base, narrowly rounded below; surface radially and concentrically sculptured so that it is retriculated throughout; within there is a strong rib, which supports the cardinal teeth.

Length 95, height at the beaks 36, at hinder end of ligament 39 mm.

Kistna River, India.

Unio footei THEOBALD, Jl. As. Soc. Beng., XLV, 1876, p. 187, pl. XIV, figs. 9, 9*a*.

Arcidopsis footei SIMPSON, Syn., 1900, p. 861.—HAAS, Con. Cab., Unio, 1910, pl. XI, figs. 2-4.

A remarkable form, which may not belong to the *Unionidæ* at all. The beaks form an angle between the anterior end and dorsum, the narrowly rounded anterior point below projecting forward in an unusual manner.

Unfortunately Theobald's Latin description of *Unio footei* is not at all complete. No laterals are mentioned, and he says nothing of the color of the epidermis or of the nacre. The beaks were too much worn in his specimens to give any characters. The shell resembles some of the Arcas of the *Barbatia* group.

The following are indeterminate Oriental Unionidæ:

Unio alfierianus BOURGUIGNAT, Voy. Choa, 1885, p. 43. Choa, Central Africa.

Unio antiniloticus BOURGUIGNAT, Bull. Soc. Zool. Fr., XI, 1880, 482, pl. XII, fig. 5. Senegal.

Unio ascia HANLEY, Biv. Shells, 1856, p. 385, pl. XXIII, fig. 20. Penang.

Unio bridouxi BOURGUIGNAT, Un. & Ir. Tan., 1886, p. 13. Lake Tanganyika.

Unio forscali PARREYSS. Where described? Egypt.

Unio gibbus SPENGLER, Skriv. Selsk. Nat., III, 1793, p. 64. Tranquebar.

Unio guillemeti BOURGUIGNAT, Un. & Ir. Tan., 1886, p. 15. Lake Tanganyika.

Unio hamyanus BOURGUIGNAT, Voy. Choa., 1885, p. 42. Central Ethiopia.

Unio idgi BOURGUIGNAT, Moll. Terr. et Fluv. Choa, 1885, p. 39. Choa, Africa.

Unio ilqui SOLEILLET, Voy. Choa, 1885, p. 40. Central Ethiopia.

Unio josseti BOURGUIGNAT, Un. & Ir. Tan., 1886, p. 19. L. Tanganyika.

Unio jouberti BOURGUIGNAT, Un. & Ir. Tan., 1886, p. 8. L. Tanganyika.

Unio lavigerinus BOURGUIGNAT, Un. & Ir. Tan., 1886, p. 14. L. Tanganyika.

Unio ligula MOUSSON, L. & S. W., Moll. Java, 1849, p. 94. Java.

Unio longitudinatus ANTON, Verz der Conch.

Unio madagascariensis SGANZIN, Mem. Soc. Hist. Strab., 1846, p. 8. Mahoupa River, Madagascar. No figure.

Unio menardi BOURGUIGNAT, Un. & Ir. Tan., 1886, p. 20. L. Tanganyika.

Unio meneliki, SOLEILLET, Voy. Choa, 1885, p. 41. Central Ethiopia.

Unio moineti BOURGUIGNAT, Un. & Ir. Tan., 1886, p. 11. L. Tanganyika.

Dysnomia pavonina ROCHEBRUNE, Bull. Soc. Phil., 1882, p 43. Cochin, China.

Unio schweinfurthi VON MARTENS, S. B. Nat. Fr., 1886, p. 127. Egypt.

Unio sitifensis MORELET, J. de Conch., 1853, p. 298.

Unio soleilleti BOURGUIGNAT, Voy. Choa, 1885, p. 39. Central Ethiopia.

Loncosilla solenoides RAFINESQUE, Cont. Mon., 1831, p. 7. Jellinghy River, Bengal.

Unio subamygdalinus DROUET, J. de Conch., 1895, p. 33. West Africa.

Unio truncatus SPENGLER, Skiv. Selsk. Nat., III, 1793, p. 66. Tranquabar.

Unio vinckei BOURGUIGNAT, Un. & Ir. Tan., 1886, p. 18. L. Tanganyika.

Unio visseri BOURGUIGNAT, Un. & Ir. Tan., 1886, p. 21. L. Tanganyika.

LAMPHORHAMPHUS.

Male and female shells alike; dull-colored; beak sculpture nearly or quite radial, marsupium occupying the entire inner branchiæ, forming a pad-like mass.

Genus TETRAPLODON Spix, 1827.

Castalia LAMARCK, An. sans Vert., VI, 1819, p. 66.

Tetraplodon SPIX, Test. Fluv. Bras., 1827, p. 32.

Prisodon LEA, Synopsis, 1852, p. 18.

Shell triangular, solid, inflated, with a high, sharp posterior ridge, behind which it is decidedly truncated; beaks very full and high, sculpture strictly radial, or with one or two pairs of the central bars coalescing below, the whole extending more or less over the disk as strong ridges; epidermis thick, dark, dull-colored; hinge line arched; there is a very strong, compressed pseudocardinal in the left valve, and there are two in the right, all in front of the beaks; behind them are several denticles; one lateral in the right valve and two in the left; all the teeth strongly vertically ridged; beak cavities deep, not compressed; anterior muscle scars small, deep; nacre whitish.

Animal having the labial palpi wider than long; margins of mantle inferiorly open, but united posteriorly to form two siphons, branchial and anal; branchial opening surrounded with papillæ; anal opening smooth; outer branchiæ united to the mantle to their posterior ends; inner united to the abdominal sac; foot tongue-shaped, thick, produced anteriorly. (Troschel.)

Type, *Tetraplodon pectinatum* Spix.

A very natural, small group of South American Unionidæ. The shells are generally triangular with high beaks having radical sculpture, which extends well on to the disk and in some cases all over it. The teeth are usually strongly vertically sculptured, the pseudocardinals are often somewhat split up.

KEY TO SPECIES OF TETRAPLODON.

Shell with very sharp, high posterior ridge, *T. quadrilaterus.*
Posterior ridge rounded or subangular.
Shell rhomboid. *T. crosseanus.*
Shell trapezoid.
With many zigzag-radial ridges. *T. multisulcatus.*
Ridges few, wide and short. *T. retusus.*
Ridges strong extending half way over the disk, *T. ovatus.*
Ridges fine, shell concentrically sculptured, *T. schombergianus; cordatus.*
Shell quadrate, nearly smooth, yellow. *T. quadratus.*
Shell more or less triangular.
Beaks nearly central. *T. ecarinatus.*
Beaks anterior.
Radial ribs strong. *T. baro; ambiguus.*
Radial ribs low. *T. juruanus; pectinatus.*

Group of *Tetraplodon ambiguus.*

Characters as in the genus.

TETRAPLODON AMBIGUUS (Sowerby).

Shell subtriangular, greatly inflated, solid, quite inequilateral; beaks very full and high, their sculpture consisting of strong, radial bars, which extend well over the disk, in some cases to the base of the shell; anterior end narrowed and rounded; base almost straight or curved; dorsal slope suddenly and obliquely truncate, often somewhat angular behind the ligament; posterior ridge very full and high, narrowly rounded, ending in a blunt point at or near the base of the shell; epidermis thick, brownish, dull, showing concentric growth lines; teeth vertically striate; pseudocardinals split up, usually there are two or three more prominent than the rest in each valve; laterals single or double in the right valve, double in the left; beak cavities deep and rounded; anterior scars small, deep; nacre whitish.

Length 60, height 42, diam. 42 mm.

Length 48, height 40, diam. 38 mm.

Amazon and Rio de la Plata River systems.

? *Prisodon truncatus* SCHUMACKER, Ess. Nouv. Syst., 1817, p. 139.

? *Castalia ambigua* LAMARCK, An. sans Vert., VI, 1819, p. 67.—GUERIN, Icon. Regne. An., 1829, pl. XXVIII.—WYATT, Man. Conch., 1838, p. 65, pl. XI, fig. 5.—CHENU, Man., 1859, II, p. 149, fig. 735.

Unio ambigua DESHAYES, Tr. Elem. Conch., 1839, p. 18, pl. XXIX, figs. 7-9.

Unio ambiguus SOWERBY, Rec. and Fos. Shells, XVI, 1823, fig. *d*.—REEVE, Conch. Syst., 1841, p. 117, pl. LXXVII, fig. 2.—DESHAYES, Tr. Elem., II, 1853, p. 219, pl. XXIX, figs. 7-9.

Tetraplodon ambiguus SIMPSON, Syn., 1900, p. 863.—VON IHERING, Abhandl. Senckenb. Naturf. Ges., 32, 1910, p. 125, pl. 12, figs. 4*a*-*d*.

Tetraplodon pectinatum SPIX, Test. Fluv. Bras., 1827, p. 32, pl. XXV, fig. 3.

Castalia inflata d'ORBIGNY, Guer. Mag., 1835, p. 43.—HANLEY, Biv. Shells, 1843, p. 173, pl. XXIV, fig. 12.—d'ORBIGNY, Voy. Am. Mer. 1843, p. 598, pl. LXXII, figs. 4-10.

Castalia turgida HUPE, Moll. Nouv., III, 1857, p. 76, pl. XIV, fig. 1.—SOWERBY, Conch. Icon., XVII, 1869, pl. III, fig. 11.

Castalia hanleyana SOWERBY, Conch. Icon., XVII, 1869, pl. I, fig. 5.

Castalia carolinensis SOWERBY, Conch. Icon., XVII, 1869, pl. II, fig. 6.

Castalia cordata STROBEL, Mat. Mal., Pt. I, 1874, p. 75.

An exceedingly variable form, some specimens being quite elongated and straight on the base line; others are much slighter, are rounded below, and almost rhomboid.

Schumacher gave only a brief description of his *Prisodon truncatus*, and referred to no figure, and the same can be said of Lamarck regarding his *Castalia ambigua*, both of which are supposed by authors to be the above species. But either of these descriptions apply equally well to several species, therefore they can not be considered authentic.

TETRAPLODON PECTINATUS Spix.

Shell subtriangular, inflated, subsolid, inequilateral, with moderately full, high beaks; anterior end narrowed and rounded; base lightly curved; dorsal slope arched; posterior ridge elevated, rounded, ending in a point above the base; surface with low, radiating ridges, which become rather feeble below, the dorsal slope, ridged only near the beaks. Epidermis fuscous or brownish; teeth rather delicate, elegantly vertically striate; beak cavities deep; anterior scars impressed; nacre silvery, thinner behind.

Length 43, height 27, diam. 22 mm.

Type locality, Rio Sao Francisco, Brazil.

Tetraplodon pectinatum Spix, Test. Fluv. Bras., 1827, p. 32, pl. xxv, fig. 4.

Tetraplodon ambiguus, (part), Simpson, Syn., 1900, p. 863.

Spix gives two figures, 3 and 4. I believe that fig. 3 is *T. ambiguus.* Fig. 4 shows only the interior of two valves, but they agree exactly with an old broken shell in my collection. It is probably a valid species. There are other forms between it and *ambiguus.*

TETRAPLODON JURUANUS von Ihering.

"The form of the only specimen is similar to that of *T. pectinatus,* but the anterior end is smaller and the dorsal margin slopes quite sharply to the hinder end; a double posterior ridge separates the side of the shell from the smooth posterior slope, which is not the case in *pectinatus.* The epidermis is blackish, whereas it is brown in *pectinatus.* The scar of the anterior adductors lies in front of the cardinal tooth and in front of it the anterior part of the shell protrudes as far as the adductor is wide, whereas this part of the shell in *pectinatus* is only half the width of the adductor. The lateral teeth are short, whereas in *pectinatus* they are very long. In my specimen the laterals of the left valve are 13 mm. long and the distance of the anterior edge of the cardinal tooth from the beginning of the lateral teeth measures the same.

It is clear, therefore, that we are dealing with two related species, which, however, differ in the characters of the hinge, the position of the beaks, etc.

The free border of the lunula on the Jurua specimen is slightly convex, which is similar in *T. ambiguus.*

Length 46, height 30, diam. 21 mm. The beaks are situated at 37-100 of the length." (von Ihering).

Type locality, Rio Jurua, Brazil.

Tetraplodon ambiguus VON IHERING, Rev. Mus. Paul., VI, 1904, p. 460.

Tetraplodon juruanus VON IHERING, Abhandl. Senckenb. Naturf. Ges., 32, 1910, p. 126.

TETRAPLODON BARO von Ihering.

"This rather thick-shelled species with high, inflated beaks, straight basal margin and long oval form has absolutely no near relationship to the genuine *Castalia ambigua* of Lamarck. The beaks are placed far forward, situated at 16-100 of the length. I have it from the Amazon." (von Ihering).

Unio ambiguus KUSTER, Conch. Cab., 1851, p. 165, pl. XLVIII, fig. 1.

Castalia ambigua SOWERBY, Conch. Icon., XVII, 1869, pl. 1, fig. 1*a-c*.

Tetraplodon ambiguus, (part), SIMPSON, Syn., 1900, p. 863.

Tetraplodon baro VON IHERING, Abhandl. Senckenb. Naturf. Ges., 32, 1910, p. 127.

TETRAPLODON QUADRILATERUS (d'Orbigny).

Shell rather large, triangular rhomboid, subsolid, inflated, inequilateral; beaks high and full, with very strong, wide, radial ribs, which extend almost to the base; posterior ridge very high, sharply angled, ending in a blunt point near the base of the shell; anterior end narrow and rounded; base lightly curved; posterior end sharply and obliquely truncate, raised to an angle behind the short ligament; dorsal slope radially sculptured near the beaks; epidermis brownish, thick, dull, showing growth lines; pseudocardinals subcompressed, split, vertically striate; laterals single in the right valve, double in the left, obliquely or feebly vertically striate; beak cavities deep, rounded; anterior scars impressed; nacre bluish-white.

Length 77, height 55, diam. 41 mm.

Length 68, height 50, diam. 40 mm.

Tropical South America east of the Andes.

Castalia quadrilatera d'ORBIGNY, Guer. Mag., 1835, p. 42; Voy. Am. Mer., 1843, p. 599, pl. LXXIII.

Tetraplodon quadrilaterum SIMPSON, Syn., 1900, p. 864.

Mya ambigua WOOD, Ind. Test. Rev., 1856, p. 200, pl. I (supp.), fig. 9.

Castalia acuticosta HUPÉ, Moll. Nouv., III, 1857, p. 77, pl. XIV, fig. 3.—SOWERBY, Conch. Icon., XVII, 1869, pl. III, figs. 12, 12*a*, 12*b*.

Castalia latiquadrata SOWERBY, Conch. Icon., XVII, 1869, pl. II, fig. 10.

Close to *ambiguus*, but larger, thinner, less inflated, with stronger, wider ribs, which are more developed on the posterior slope than in that species. The hinge is more delicate, the laterals less vertically striate

TETRAPLODON CORDATUS (H. and A. Adams).

Shell but slightly inflated, triangular rhomboid, inequilateral; beaks full, high, widely rounded, having numerous, rounded, radial ridges separated by grooves about their own breadth, the central ridges coalesce below and all end on a line about midway over the disk; posterior ridge high, slightly double below, sharp above, ending in a blunt point at the base of the shell; dorsal line straight, short, meeting the oblique posterior truncation at a decided angle; base line nearly straight; surface with decided, concentric sculpture; epidermis olive; nacre bluish.

Length 87, height 65 mm.

British Guiana.

Castalia cordata H. and A. ADAMS, Gen. Rec. Moll., II, 1857, p. 509, III, pl. CXX, figs. 2, 2*a*.—SOWERBY, Conch. Icon., XVII, 1869, pl. II, fig. 8.

Tetraplodon quadrilaterum, (part), SIMPSON, Syn., 1900, p. 864.

H. and A. Adams figure a young shell and credit the species to Humphry, but do not describe it.

The description by Sowerby of this form is inadequate and the figure shows a shell much resembling *T. quadrilaterus*. It may, however, be distinct. It seems to be more strongly, concentrically sculptured and to have shorter, narrower, more numerous umbonal ridges, which end higher up on the shell, and the inner ones coalesce below, while in *quadrilaterus* they do not.

TETRAPLODON OVATUS (Sowerby).

Shell subquadrately triangular, solid, inequilateral; beaks full and high, rather sharp, having a few, strong, widely spaced radial ribs, which extend about half way over the disk and suddenly end at one of the growth lines; anterior end cut away above, rounded below; base line curved; outline of dorsal slope oblique, elevated to a decided angle in the middle; posterior ridge full, sharp above, ending in a blunt, point near the base of the shell, the outline above this point being slightly incurved; epidermis pale olive with concentric, darker bands.

Length 66, height 52 mm.

Brazil.

Castalia ovata SOWERBY, Conch. Icon., XVII, 1869, pl. 1, fig. 4.
Tetraplodon ovatus SIMPSON, Syn., 1900, p. 864.

Sowerby never gave any measurements or descriptions of the interior of his *Naiades* and for that reason I am unable to fully compare this with *quadrilaterus*, to which it seems closely allied. The radial bars are wider and more widely spaced than in *quadrilaterus*, they end suddenly and evenly near the middle of the disk, the color is lighter and is banded.

TETRAPLODON RETUSUS (Hupé).

Shell almost regularly triangular, inflated, solid, somewhat inequilateral, with a short ligament; beaks very high, full, sculptured with a few, wide, radial ridges separated by narrower grooves; the ridges do not extend half way over the disk; the rest of the shell is rudely and irregularly concentrically sculptured; posterior ridge high, narrowly rounded, ending in a blunt point near the base of the shell; above the posterior ridge on the decidedly truncate posterior slope there is a broad, radial furrow, which ends in a slight sinus; dorsal slope subangular behind the ligament; pseudocardinals solid, subcompressed, rough but not split; laterals somewhat vertically striate; beak cavities deep, round; anterior scars deep; nacre white, iridescent behind.

Length 65, height 49, diam. 41 mm.

Guiana; Amazon?

Castalia ambigua Sowerby, Conch. Man., 1839, fig. 140.

Castalia retusa Hupé, Mol. Nouv., III, 1857, p. 75, pl. xiv, fig. 2.—Sowerby, Conch. Icon., XVII, 1869, pl. 1, fig. 2.

Tetraplodon retusus Simpson, Syn., 1900, p. 864.

Close to *T. ambiguus* and it may be only a variety of that. It differs in having only a few, wide radial ridges on the umbones, which extend but a short distance over the disk, in being strongly and irregularly concentrically sculptured, and in having more compact, less split-up pseudocardinals.

TETRAPLODON QUADRATUS (Sowerby).

Shell solid, subquadrate or subrhomboid, inequilateral; beaks very full and high, turned forward, with a few strong radial ribs, which extend about one-third of the distance from the beaks to the base, the rest of the shell nearly smooth; posterior ridge much elevated, decidedly rounded, apparently bordered by sulci at each side, ending in a point at the base of the shell; epidermis straw-colored; teeth strong; anterior scars deep, small; nacre apparently pinkish.

Length 26, height 22 mm.

Guiana.

Castalia quadrata Sowerby, Conch. Icon., XVII, 1867, pl. ii, figs. 7, *a*, *b*.

Tetraplodon quadratus Simpson, Syn., 1900, p. 864.

This may be only the young of a form, which becomes much larger when mature, but the shell is described as solid. Its smooth, straw-colored surface and the rounded cord-like posterior ridge should distinguish it from any others.

TETRAPLODON SCHOMBERGIANUS (Sowerby).

Shell biangular subquadrate, thin, concentrically wrinkled, somewhat inequilateral; beaks moderately high and rounded; posterior ridge elevated and rounded, ending in a blunt point a little above the base of the shell; post-dorsal slope elevated into a low wing, which is rounded behind the ligament and obliquely truncate behind; umbonal region having rather feeble, wavy, radial sculpture, which does not extend far over the disk; epidermis copper-colored; teeth thin, lamellar.

Length 50, height 40 mm.

Guiana.

Castalia schombergiana SOWERBY, Conch. Icon., XVII, 1869, pl. I, fig. 3.

Tetraplodon schombergianus SIMPSON, Syn., 1900, p. 864.

A thin species with lamellar teeth, feeble umbonal sculpture and coppery epidermis.

Group of *Tetraplodon multisulcatus*.

Shell small, somewhat compressed, with a moderate posterior ridge, and covered throughout with delicate ridges; teeth more unionoid than in the typical Tetraplodons.

Animal unknown.

TETRAPLODON MULTISULCATUS (Hupé).

Shell subtriangular, somewhat compressed, inequilateral; beaks only moderately full, sculptured with numerous delicate, radiating, more or less zigzag ridges, which extend over the whole shell; posterior ridge not greatly elevated, subangular above, ending in a blunt point near the base of the shell; anterior end narrowed, cut away above and below, narrowly rounded; dorsal slope elevated into a low wing, which is obliquely trunate behind the ligament; epidermis fuscous, greenish-tinted; teeth vertically striate; nacre whitish, pearly.

Length 42, height 30, diam. 23 mm.

Brazil.

Castalia multisulcata HUPÉ, Moll. Nouv., III, 1857, p. 75, pl. XIV, fig. 4.

Tetraplodon multisulcatus SIMPSON, Syn., 1900, p. 865.

Castalia multicostata SOWERBY, Conch. Icon., XVII, 1869, pl. II, figs. 9, *9a, 9b*.

Castalia ambigua BLAINVILLE, Man., 1825, p. 539, pl. LXVII, fig. 4.

For a *Tetraplodon* this shell is but little inflated. It is covered throughout with somewhat delicate subzigzag, radiating ribs.

TETRAPLODON ECARINATUS (Mousson).

Shell subtriangular, not very solid nor greatly inflated, scarcely inequilateral; beaks only moderately high, sculptured with numerous radiating ridges, which cover the entire shell; these are crossed by concentric threads over the whole surface; anterior end narrowed and rounded; base line rounded; dorsal slope obliquely truncate, angled a little behind the ligament; epidermis fuscous; posterior ridge rather low, subangulate above; teeth compressed, serrate; beak cavities deep; nacre pearly, iridescent.

Length, 47, height 35, diam. 25 mm.

Puerto Nuevo, Magdalena River, Colombia.

Castalia ecarinata MOUSSON, Mal. Bl., XVI, 1869, p. 185.—PFEIFFER, Nov. Conch., IV, 1876, p. 140, pl. CXXXI, figs. 9, 10.

Tetraplodon ecarinatus SIMPSON, Syn., 1900, p. 865.

The beaks in this species are placed only a little in front of the center; the whole surface is strongly sculptured with from 22 to 24 radial ribs, which are crossed by strong growth lines.

TETRAPLODON CROSSEANUS (Hidalgo).

Shell subrhomboid, subsolid, compressed, inequilateral, sculptured with numerous, curved, radial costæ, the anterior end granular, the posterior end nearly smooth; beaks rather low; anterior end widely rounded, cut away a very little below; base line nearly straight; post-dorsal outline strongly curved from the beaks to the rather sharp basal point at the termination of the rounded posterior ridge; epidermis bronze-color; teeth subcompressed; nacre light wine-color.

Length 25, height 20, diam. 11 mm.

Imbabura, Ecuador.

Castalia crosseana Hidalgo, Jl. de Conch., XIII, 1865, pp. 316 and 429, pl. xiv, fig. 2.

Tetraplodon crosseanus Simpson, Syn., 1900, p. 865.

This species is more nearly rhomboid in form than any of the Tetraplodons. The figure, which is not very finely finished, represents the epidermis as a sort of olive-color, rayed with burnt brown.

Genus CASTALINA von Ihering, 1891.

Castalina von Ihering, Zool. Anzeiger, 1891, p. 478.

Shell somewhat triangular, inflated, but having the sides a little flattened, solid, with a strong posterior ridge, the subtruncate posterior slope rising almost to a wing above; beaks full, high, with nearly strictly radial sculpture; surface slightly, irregularly, concentrically sulcate, sometimes a little corrugated; posterior slope generally plicate or corrugated; epidermis thick, rayless, blackish; hinge plate arched, wide; two to several radial pseudocardinals in each valve; two vertically or obliquely striate laterals in the left valve and one in the right; beak cavities deep; anterior muscle scars deep, united; nacre whitish.

Animal, probably very much like that of *Tetraplodon,* but with the mantle closed or open at the branchial and anal openings.

Type, *Castalina martensi* von Ihering.

The species, which are placed in this group, are evidently closely allied to the genus *Tetraplodon,* but have, on the whole, more unionoid characters. The shells are generally more compressed, the radial sculpture is more feeble, the teeth are not so strongly vertically striate. In *Castalina* the pseudocardinals are radial, while in *Tetraplodon* they are not. In the latter group the mantle is closed behind into siphons while in *Castalina* it may be open or closed.

KEY TO SPECIES OF CASTALINA.

Shell with strong posterior folds.	*C. undosa.*
Smooth or but feebly plicate behind.	
Almost strictly rhomboidal.	*C. orbignyi.*
Subrhomboid or subtriangular.	
With strong, elongated umbonal ridges.	*C. psammoica.*
Umbonal ridges short.	
Post-dorsal groove well developed.	*C. martensi.*
Post-dorsal groove scarcely developed.	*C. nehringi.*

Group of *Castalina martensi.*

Characters as in the genus.

CASTALINA MARTENSI von Ihering.

Shell irregularly rhomboid, slightly inflated, having the disks a little flattened, solid, inequilateral; beaks moderately full and elevated, their sculpture consisting of a few wide, rather feeble, radial ridges, separated by narrow grooves, these ridges do not extend over the disk; posterior ridges well developed, narrowly rounded; above it is a deep, wide, radial groove, which usually ends in a slight sinus on the border of the dorsal slope; anterior end somewhat narrowed, rounded; base line curved; dorsal slope obliquely truncate, there being a rounded point at the hinder end of the posterior ridge; surface irregularly, concentrically sculptured, there sometimes being a few, faint wrinkles on the dorsal slope; epidermis thick, brown, rather dull; pseudocardinals radial, split up into three or four divisions in each valve, but slightly roughened; laterals double in the left valve, single in the right, slightly vertically or sometimes obliquely striate; nacre dirty whitish or brownish-purple, thickened in front; beak cavities deep; anterior scars impressed.

Length 73, height 53, diam. 32 mm.

Southern Brazil.

Castalina martensi VON IHERING, Zool. Anz., XIV, 1891, p. 477; Arch. für Nat., 1893, p. 81, pl. III, fig. 5.—SIMPSON, Syn., 1900, p. 865.

The shell is rather more elongated and rhomboid than either of the allied forms.

CASTALINA NEHRINGI von Ihering.

Shell short, subrhomboid, somewhat inflated, solid, slightly inequilateral; beaks full and high with very feeble, radial sculpture, which does not extend far over the umbonal region; posterior ridge high and angled above, the shell having its greatest diameter at the ridge, ending in a rounded point behind at the shell's base; dorsal line short, nearly straight, meeting the obliquely truncate dorsal slope at an angle; base nearly straight; surface irregularly, concentrically sculptured, with a few wrinkles on the dorsal slope; epidermis dark brown, thick; pseudocardinals radial, nearly smooth; laterals short, obliquely striate; beak cavities deep; nacre dirty white, thick in front.

Length 57, height 47, diam. 28 mm.

Southern Brazil.

Castalina nehringi VON IHERING, Zool. Anz., XIV, 1891, p. 477; Arch. für Nat., 1893, p. 75, pl. III, fig. 4.—SIMPSON, Syn., 1900, p. 865.

A shorter shell than *C. martensi;* it has higher beaks, a more elevated, sharp posterior ridge, straighter base, and smaller, smoother teeth than that species. The radial furrow behind the posterior ridge is scarcely developed.

CASTALINA PSAMMOICA (d'Orbigny).

Shell rhomboid triangular, subinflated, solid, inequilateral; beaks rather full and high, their sculpture consisting of wide, low ridges separated by wide grooves and extending half way over the disk; posterior ridge high, narrowly rounded, ending in a blunt point at the base of the shell; dorsal line short, lightly arched; posterior end having a long, oblique truncation; base a little curved; anterior end cut away a little above, rounded below; surface with strong, irregular growth lines and feeble traces of radial sculpture; epidermis pale brownish or greenish-brown; pseudocardinals about three in each valve, radial, comparatively smooth; laterals two in the left valve and one in the right with faint, oblique, granular striation; beak cavities deep; nacre bluish-white, thickened in front.

Length 68, height 50, diam. 33 mm.

Tributaries of the Rio de la Plata.

Unio psammoica d'ORBIGNY, Guer. Mag,. 1835, p. 35; Voy. Am. Mer., 1843, p. 608, pl. LXXI, figs. 4-7.—KUSTER, Conch. Cab. Unio, 1861, p. 263, pl. LXXXVIII, fig. 4.

Castalina psammoica VON IHERING, Arch. für Nat., 1893, p. 79. —SIMPSON, Syn., 1900, p. 866.

Margaron (Unio) psammoicus LEA, Syn., 1852, p. 19; 1870, p. 30.

Unio psammoicus SOWERBY, Conch. Icon., XVI, 1868, pl. XCIII, fig. 507.

This species has been placed with *Unio,* but von Ihering correctly referred it to his new genus *Castalina.* It is more triangular than *C. martensi,* has stronger and more extended beak sculpture, the surface is subdecussated, and the teeth are not so strong, nor are they vertically striated.

CASTALINA UNDOSA (von Martens).

Shell subtriangular, solid, slightly inflated, inequilateral; beaks high and full, their sculpture feebly radial; posterior ridge prominent, angled, often curved upward in the middle, placed near the post-dorsal border, ending behind in a rounded point near the shell's base; base line lightly curved; surface rudely and irregularly, concentrically sculptured, the abrupt, subtruncate dorsal slope covered with strong plications; epidermis thick, blackish; pseudocardinals more or less split up, radial, and, with the laterals, vertically striate; beak cavities deep; nacre bluish-white, not greatly thickened in front.

Length 63, height 53, diam 30 mm.

Southern Brazil.

Castalia undosa VON MARTENS, S. B. Nat. Fr., 1885, p. 148; Conch. Mitth., III, 1885, p. 19, pl. XLII, figs. 2, 3.

Castalina undosa SIMPSON, Syn., 1900, p. 866.

This may be at once separated from the other allied species by its strong folds running nearly across the dorsal slope. The upper anterior region of the shell is sometimes corrugated.

Group of *Castalina orbignyi.*

Shell irregularly rhomboid, somewhat compressed, equilateral, anterior end rounded, posterior truncate, having a wide, shallow, radiating furrow above the rounded posterior ridge, which causes a sinuosity in the outline; epidermis brownish-yellow; hinge crenate; one pseudocardinal in the left valve and two in the right, which are jagged or somewhat broken up; laterals elongate and striate.

CASTALINA ORBIGNYI (Hupé and Deville).

Shell subrhomboid, almost or quite equilateral, ponderous, but little inflated; beaks high and rounded, apparently without sculpture; posterior ridge well developed, narrowly rounded, terminating in a blunt point at the base of the shell; above it there is a wide, radial furrow that ends in a slight sinus below; hinge line arched, straight and sloping in front of and behind the beaks; posterior end obliquely truncate; base almost straight; anterior end cut away below, narrowly rounded above; pseudocardinals ragged, laterals short; nacre whitish, thickened in front.

Length 97, height 77, diam. 50 mm.

Upper Amazon.

Unio orbignyi HUPÉ and DEVILLE, Rev. et Mag., 1850, p. 645, pl. XVI, fig. 1.

Margaron (Unio) orbignyi LEA, Syn., 1852, p. 24; 1870, p. 37.

Castalina orbignyi SIMPSON, Syn., 1900, p. 866.

Unio orbignyana HUPÉ, Moll. Nouv., III, 1857, p. 83, pl. XVII, fig. 1.

Unio d'orbignyanus SOWERBY, Conch. Icon., XVI, 1868, pl. XCVI, fig. 523.

Unio orbignyanus PÆTEL, Conch. Sam., III, 1890, p. 162.

A large species, which is more nearly rhomboid in outline than any of the others. The surface appears to be strongly and irregularly, concentrically striate; the beaks are, according to the authors, without sculpture, but the specimen figured is slightly eroded in this region. The epidermis is light brown.

Genus CASTALIELLA Simpson, 1900.

Castaliella SIMPSON, Syn., 1900, p. 866.

Shell subtriangular, greatly inflated, subsolid, and strongly sulcate; beaks high, the sculpture regularly radiate; posterior ridge well defined and sharp; hinge line narrow, arched; there are two vertically striate pseudocardinals in the right valve, the lower the larger and split, separated by a parallel-sided socket, and three in the left standing side by side, the middle one the largest, the lower two torn, with a few small tubercles in each valve behind them; one lateral in the right valve and two in the left, granular, and showing traces of vertical striation; beak cavities deep, not compressed; nacre purple.

Animal unknown.

Type, *Castalia sulcata* Krauss.

CASTALIELLA SULCATA (Krauss).

Shell subtrapezoid or suborbicular, inflated, subsolid, inequilateral; beaks full and rather high, sculptured with a few radial bars, of which the anterior are short and faint, while those at the posterior ridge extend well out on the disk; posterior ridge well developed, subangular, ending in a blunt point above the base of the shell; hinge line arched, much elevated behind the beaks; dorsal slope obliquely subtruncate; anterior end and base rounded; surface covered with strong, even, concentric ridges, which become a little blurred in front of the posterior ridge; on the posterior slope there are in addition a few wrinkles; epidermis reddish-brown, shining; nacre a little thicker in front.

Length 50, height 45, diam. 31 mm.

Surinam.

Castalia sulcata KRAUSS, Zeits. für Mal., 1849, p. 99.
Castaliella sulcata SIMPSON, Syn., 1900, p. 867.
Unio kraussii LEA, Pr. Ac. N. Sci. Phila., VI, 1853, p. 376.
Margaron (Unio) kraussii LEA, Syn., 1870, p. 35.

A peculiar species, apparently most closely related to *Castalina* and possibly to be referred to that as a subgenus. The decided regular, concentric sculpture and purplish nacre are characters which I have not seen in any related group. In the shells of *Castalina* the disks are somewhat flattened; in this species they are convex.

Lea received this shell from Dr. Dunker under the name of *Castalia sulcata* Krauss. Believing it to be a *Unio*, he placed it in that genus, and the name *sulcatus* being preoccupied in *Unio*, he changed it as above.

Genus CALLONAIA Simpson, 1900.

Callonaia Simpson, Syn., 1900, p. 867.

Shell triangular, thin, inflated, with very high, full beaks which appear to be without sculpture; a very high, sharp posterior ridge extends to the base of the shell, above which it is decidedly truncated; anterior end somewhat pointed above, rounded below; ligament very short; surface nearly smooth, but somewhat sulcate anteriorly; epidermis bright, greenish-yellow, shining; hinge line strongly arched; teeth compressed, high; two pseudocardinals in each valve, all interlocking and side by side; one lateral in the right valve and two in the left, a little ragged and granularly, vertically striate; beak cavities very deep, not compressed; muscle scars superficial; nacre brilliant, bluish-white, radiately striate posteriorly.

Animal unknown.

Type, *Castalia duprei* Recluz.

Callonaia duprei (Recluz).

Shell subtriangular, inflated, rather thin, slightly inequilateral; beaks very high and full; ligaments short and broad; hinge line much arched; upper anterior outline from the beaks forward obliquely truncate, below this it is narrowly rounded and the anterior base is slightly cut away; base line nearly straight; posterior basal point sharp; surface with delicate growth lines, which are stronger anteriorly; epidermis pale yellowish-green, shining, darker and dull-colored on the posterior slope; nacre slightly thickened in front.

Length 70, height 56, diam. 42 mm.
Length 68, height 53, diam. 35 mm.
Great lakes of Para, Brazil.

Castalia duprei Recluz, Rev. Zool. 1843, p. 305, pl. xxxv.—Chenu, Man., 1859, II, p. 149, fig. 738.

Unio duprei Catlow and Reeve, Conch. Nom., 1845, p. 58.

Margaron (Prisodon) duprei Lea, Syn., 1852, p. 18; 1870, p. 27.

Callonaia duprei Simpson, Syn., 1900, p. 867.

Castalia dolabella Sowerby, Conch. Icon., XVII, 1869, pl. iii, figs. 13*a*, 13*b*, 13*c*.

A remarkable and beautiful Naiad, which is apparently related to *Tetraplodon* and *Castalina*, but cannot be referred to either. The posterior truncation is more abrupt and the posterior ridges are more sharp and elevated than in any Unione that I am acquainted with. When the shell is held so that the eye falls direct on the anterior dorsal portion the outline presented is that of a blunt wedge.

Genus HYRIA Lamarck, 1819.

Hyria Lamarck, An. sans. Vert., VI, 1819, p. 81.
Triplodon Spix, Test. Fluv. Bras., 1827, p. 35.
Naïa Swainson, Tr. on Mal., 1840, p. 379.

Shell subrhomboidal, solid, slightly inflated, narrower and dorsally winged in front, and having a post-dorsal wing; posterior ridge often double, causing the shell to be biangulate behind; beaks low, with strong, nearly radial sculpture, the central bars coalescing below, the whole continuing as strong, radial and zigzag ridges over more or less of the disk; epidermis thick, greenish when young, brownish or blackish when old; there are two or more rather short, compressed pseudocardinals in each valve, which are much split up into denticles; one lateral in the right and two in the left valve; teeth often somewhat vertically striated; dorsal scars numerous; nacre whitish.

Animal with mantle lobes united together behind and furnished with two short, contractile siphons. (J. E. Gray.)

Type, *Hyria corrugata* Lamarck.

In 1753 Klein (Testamen Méthodi, p. 135, pl. 9, fig. 36) used the name *Triquetra* for the shell, which has since been known as *Hyria syrmatophora* Gronovius. In 1817 Schumacher founded the genus *Prisodon* (Essai Nouv. Système, p. 138), in which under section *a* he placed his *P. obliquus*, a smooth species considerably drawn out, and in section *b* he put *P. truncatus*, which is probably the same as the *Castalia ambigua* of Lamarck. These certainly belong to two genera. Dr. Lea in the Synopsis used Klein's name for the winged shell (*Hyria corrugata* Lamarck), and used the name *Prisodon* for

Schumacher's section *b*, (*P. truncatus Schum*). Lea erred in this, because Klein was not a binomial author, and his name can not be used. In the Proceedings of the U. S. National Museum, XVIII, 1896, p. 315, I restored the name of *Prisodon* Schumacher to the first section, pointing out that the *P. obliquus* Schumacher must stand as its type. Two years after Schumacher's name appeared Lamarck published the generic name *Hyria* in the Animaux sans Vertèbres, VI, 1819, p. 81, and placed in it first his *H. avicularis*, which equals Schumacher's *P. obliquus*, and secondly *H. corrugata*. I now believe that these corrugated forms are generically distinct from the smooth ones, and as Schumacher's *Paxyodon* is almost certainly founded on one of the smooth species, Lamarck's name *Hyria* can be used by elimination for the *corrugatus* and allied forms.

KEY TO SPECIES OF HYRIA.

Shell with radial pseudocardinals,	*H. stevensi.*
Pseudocardinals more or less longitudinal.	
Entire surface subradially sculptured,	*H. rugosissima.*
Later growth usually not radially sculptured.	
Triangular, earlier growth radially sculptured; later growth concentrically sculptured.	*H. latialata.*
Rhomboid, only a few strong umbonal ridges.	*H. transversa.*
Subrhomboid, surface more or less radially sculptured.	*H. corrugata.*

Subgenus HYRIA s. s.

Characters as in the genus.

Type, *Hyria corrugata* Lamarck.

HYRIA CORRUGATA Lamarck.

Shell subtrapezoid, convex or slightly inflated, varying from almost thin to solid, inequilateral; beaks low, subcompressed, sculptured with strong, subradial ribs, which usually converge in front of the posterior ridge and are often divaricate along it; this sculpture often extends more or less over the disk and occasionally becomes zigzag or subnodulous; posterior ridge well developed, often subangular above and semi-double below, where it ends in a feeble biangulation; dorsal outline arched, extending into a decided wing in front and behind; anterior end narrowed, cut away below, posterior end usually obliquely truncate, often incurved; epidermis greenish-brown; pseudocardinals compressed, much split up; laterals long and straight in young shells, short and curved in old ones, all the teeth more or less vertically striate; nacre usually lurid, sometimes silvery, thicker in front in old shells.

Length 107, height 63, diam. 27 mm.

Length 94, height 60, diam. 34 mm.

Eastern Peru to Guiana; south throughout Brazil.

Hyria corrugata LAMARCK, An. sans Vert., VI, 1819, p. 82.—SOWERBY, Rec. and Foss. Shells, 1823, No. XVI, fig. *d;* Conch. Man., 1839, fig. 144.—REEVE, Conch. Syst., I, 1841, p. 120, pl. XC, fig. 2.—KUSTER, Conch. Cab. Unio, 1856, p. 140, pl. XLI, fig. 1.—CHENU, Man., 1859, II, p. 149, fig. 733.—REEVE, Elem. Conch., II, 1860, pl. XXXI, fig. 179.—SOWERBY, Conch. Icon., XVII, 1869, pl. I, fig. 1.—SIMPSON, Syn., 1900, p. 868.

? Unio corrugata BLAINVILLE, Man., 1825, p. 539, pl. LXVII, fig. 1.

Margaron (Triquetra) corrugata LEA, Syn., 1852, p. 17; 1870, p. 25.

Triquetra corrugata H. and A. ADAMS, Gen. Rec. Moll., II, 1857, p. 508.

? Triplodon rugosum SPIX, Test. Fluv. Bras., 1827, p. 35, pl. XXIX, figs. 1, 2.

Hyria rugosa DESHAYES, Enc. Meth., II, 1827, p. 151, pl. CCXLVII, fig. 2.

Mya angulata WOOD, Ind. Test. Sup., 1828, p. 3, pl. I, fig. 12.

Margarita (Unio) angulatus LEA, Syn., 1836, p. 10; 1838, p. 13.

Hyria exasperata SOWERBY, Conch. Icon., XVII, 1869, pl. II, fig. 3.

This seems to be an abundant species and subject to great variation, and for that reason it has received many names.

Some shells are strongly sculptured throughout, while others are partially so or nearly smooth. Some apparently full grown specimens are thin and but little inflated; others are solid and full.

HYRIA RUGOSISSIMA Sowerby.

Shell subrhomboid, convex, rather solid, inequilateral, with a nearly straight dorsal line, which is winged before and behind; beaks low, compressed sculptured with very strong, subradial ridges, which curve toward each other and unite below; the sculpture is carried over the entire shell, being divaricate on the moderately elevated, subangular posterior ridge and often corrugated and subnodulous; anterior end with a small wing above, rounded and slightly cut away below; base line curved, fullest behind the middle; posterior end obliquely truncate with a wing and often an incurved outline above; epidermis greenish-brown; pseudocardinals compressed, somewhat split; laterals curved, strong, remote, with the other teeth somewhat vertically striate; nacre flesh-colored, not much thickened in front.

Length 125, height 80, diam. 38 mm.

Length 107, height 85, diam. 35 mm.

Amazon River.

Hyria rugosissima SOWERBY, Conch. Icon., XVII, 1869, pl. III, fig. 5.—SIMPSON, Syn., 1900, p. 869.

Very close to *corrugata,* but a larger, much more strongly sculptured species. Several specimens of different ages are before me, all of which are heavily sculptured throughout. It is less inflated, as a rule, than *corrugata,* and the anterior end is a little wider.

HYRIA LATIALATA Sowerby.

Shell almost regularly triangular, compressed with a low anterior dorsal wing and a very high triangular posterior one; posterior ridge subangulate, ending at the base of the shell; between this point and the hinder base of the wing the shell is almost squarely, subtruncate; beaks low, their sculpture consisting of rather delicate, subradial ridges, the inner ones of which coalesce below; this sculpture is continued about half way over the disk and beyond that it is suddenly replaced by rather strong, concentric ridges; epidermis greenish-brown.

Length 118, height 97 mm.

Guiana.

Hyria latialata SOWERBY, Conch. Icon., XVII, 1869, pl. II, fig. 4.—SIMPSON, Syn., 1900, p. 869.

Sowerby gives a fine figure of this species, but no dimensions and does not describe the interior. It is remarkable for being almost regularly triangular and for having rather fine, subradial sculpture on the earlier growth, which suddenly changes to concentric sculpture.

HYRIA TRANSVERSA Hupé.

Shell subrhomboid, solid, subinflated, somewhat inequilateral; beaks rather full, having a few, very wide, subradial ridges, which extend only a short distance over the disk; posterior ridge double, ending in a wide biangulation below the median line; anterior end somewhat narrowed, rounded, with only a feeble wing above; post-dorsal wing only moderately high, obliquely truncate behind; surface rather smooth; epidermis brownish-black; hinge strong; teeth somewhat solid; nacre rose-tinted.

Length 100, height 60; diam. 35 mm.

Brazil.

Hyria transversa HUPÉ, Moll. Nouv., III, 1857, p. 79, pl. XV, fig. 1.—SOWERBY, Conch. Icon., XVII, 1869, pl. IV, fig. 7.—SIMPSON, Syn., 1900, p. 869.

An elongated, subrhomboid form remarkable for its fine, wide, short, subradial bars at and below the beaks.

Subgenus TRIQUETRANA Simpson, 1900.

Triquetrana SIMPSON, Syn., 1900, p. 869.

Shell compressed, with a feebly developed posterior wing; thickened in front; each valve with about three, somewhat divergent pseudocardinals, which are sometimes nearly smooth and at others break into denticles; one granular lateral in the right valve and two in the left, which are sometimes obliquely and faintly vertically striate; external sculpture much as in *Hyria*.

Animal unknown.

Type, *Unio stevensi* Lea.

HYRIA STEVENSI (Lea).

Shell subtriangular, subcompressed, moderately solid, inequilateral; beaks low, with numerous, subradial ridges, the inner of which coalesce below, the sculpture being extended over the entire shell and zigzagged in front; posterior ridge double, ending in a wide, feeble biangulation below; dorsal and basal outlines curved; anterior end rounded, narrowed, very slightly winged above; posterior dorsal region elevated into a low wing, which is obliquely subtruncated behind; epidermis greenish-brown; pseudocardinals radial, somewhat split up, sometimes nearly smooth; laterals remote, delicate, with faint vertical striæ; nacre lurid purplish, thicker in front.

Length 62, height 44, diam. 21 mm.

Length 64, height 47, diam. 21 mm.

Yuruari River, Guiana.

Unio stevensi LEA, Pr. Ac. N. Sci. Phila., I, 1871, p. 188; Jl. Ac. N. Sci. Phila., VIII, 1874, p. 22, pl. VII, fig. 19; Obs., XIII, 1874, p. 26, pl. VII, fig. 19.

Hyria stevensi SIMPSON, Syn., 1900, p. 869.

This species is smaller than any of the others and differs from them all in having regularly radial pseudocardinals.

It bears much the same relation to *Hyria* that *Castalina* does to *Tetraplodon*, its teeth being more unionoid than those of the other species.

Genus PRISODON Schumacher, 1817.

Triquetra KLEIN, Tent. Methodi Ost., 1753, p. 135.

Prisodon SCHUMACHER (part), Essai Nouv. Syst., 1817, p. 138.

Paxyodon SCHUMACHER, Essai Nouv. Syst., 1817, p. 139.

Shell aviculiform, solid, somewhat inflated, with a well-developed posterior ridge, the area above it being excavated, its outline from the hinder basal point to the end of the post-dorsal wing generally incurved; posterior slope often having a radial row of plications, as in *Cristaria;* surface slightly concentrically sculptured and having delicate radiating *liræ* throughout, so that the surface is microscopically reticulated; beaks full, but not elevated, without sculpture as far as noticed; epidermis yellowish-green or brownish, shining, often bronzy; hinge narrow under the beaks, widening in front and behind; left valve with two or more elongated, compressed pseudocardinals, which show a tendency to break into denticles, and two laterals; right valve with two or more similar pseudocardinals and a single lateral; laterals vertically, granularly striate.

Animal with the labial palpi triangular, the hinder parts free as in *Unio,* not united posteriorly; branchiæ large, equal in size. (Troschel.)

Type, *Mya syrmatophora* Meuschen.

The apparent want of beak sculpture, the smooth, slightly decussated, shining and often metallic surface, the post-dorsal plications, which when present, are similar to those of *Cristaria,* are, I think, characters of sufficient importance to justify the separation of these species generically from *Hyria.*

KEY TO SPECIES OF PRISODON.

Shell long, subrhomboid or subtrapezoid.	
Small, scarcely winged.	*P. brownianus.*
Large.	
Moderately winged.	*P. obliquus.*
Wings greatly produced horizontally.	*P. rectus.*
Shell short, subtrapezoid, sides compressed.	*P. complanatus.*
Shell subtriangular.	
With a cord-like posterior ridge.	*P. syrmatophorus.*
Posterior ridge low.	
Wings small.	*P. castelnaudi.*
Wings large, the hinder elevated.	*P. alatus.*
Shell elliptical or obovate, compressed.	*P. ortonii.*

Subgenus PRISODON s. s.

Characters as in the genus.
Type, *Mya syrmatophora* Meuschen.

PRISODON SYRMATOPHORUS (Meuschen).

Shell subtriangular or subtrapezoid, more or less inflated, solid, somewhat inequilateral; beaks full, more or less elevated, apparently without sculpture; posterior ridge high, generally narrowly rounded, often cord-like, occasionally semi-double below, ending at the shell's base in a point or a narrow biangulation; dorsal line usually straight, ending in a wing before and behind; anterior end narrowed, cut away and rounded below; base straight or curved; posterior end obliquely or almost squarely truncate, its outline often incurved; surface having delicate striæ of growth and fine, radiating lines and sometimes a few folds below the ligament; epidermis shining, greenish, greenish-yellow or brownish, often with metallic tints; teeth elongated, rather solid but compressed; pseudocardinals two or more in each valve; one lateral in the right valve and two in the left, all of them sometimes slightly vertically striate; muscle scars not deep; nacre bluish, flesh-colored or purplish.

Length 102, height 70, diam. 35 mm.
Length 85, height 52, diam. 34 mm.
Guiana; Brazil.

Triquetra subvirdis KLEIN, Meth. Ost., 1753, p. 135, pl. IX, fig. 36.—H. and A. ADAMS, Gen. Rec. Moll., II, 1857, p. 505; III, pl. CXX, figs. 1, 1*a*.

Margaron (Triquetra) subviridis LEA, Syn., 1852, p. 17; 1870, p. 25.

Mya syrmatophora MEUSCHEN in Gronovius, Zooph., 1781, pl. XVIII, fig. 1, 2.—WOOD, Ind. Test., 1825, p. 12, pl. II, fig. 36*b*.

Hyria syrmatophora SOWERBY, Rec. and Foss. Shells, XVI, 1823, fig. *d;* Conch. Man., 1839, fig. 143.—REEVE, Conch. Syst., I, 1841, p. 120, pl. XC, fig. 1.—WOOD, Ind. Test. rev., 1856, p. 17, pl. II, fig. 36.—HUPE, Moll. Nouv., III, 1857, p. 79, pl. XV, fig. 2.—SOWERBY, Conch. Icon., XVII, 1869, pl. V, fig. 2.

Unio syrmatophora DESHAYES, Tr. Elem., II, 1853, p. 219, pl. XXIX, figs. 10, 11.

Margarita (Unio) syrmatophorus LEA, Syn., 1836, p. 11; 1838, p. 13.

Prisodon syrmatophorus SIMPSON, Syn., 1900, p. 870.

? Paxyodon ponderosus SCHUMACHER, Ess. Nouv. Syst., 1817, p. 140, pl. XI, fig. 3.

Hyria avicularis var. *b*. LAMARCK, An. sans Vert., VI, 1819, p. 82.

Quite variable in size, outline and degree of inflation as well as color. In some specimens the posterior ridge is raised up into a strong cord; in others it is merely angular. In old shells the ligamental patch is large and distinct.

PRISODON COMPLANATUS (Hupé).

Shell subrhomboid or subtrapezoid, somewhat inequilateral, subcompressed or subinflated, slightly thickened; beaks not greatly elevated; posterior ridge widely rounded, ending in a blunt, rounded point near the base; dorsal outline nearly straight, arched up a little in the middle; winged in front and behind; anterior end rounded, narrowed and cut away below; base line curved; posterior end obliquely truncate, incurved; epidermis brownish-black; pseudocardinals strongly, vertically striate; nacre bluish-white, iridescent.

Length 85, height 70, diam. 35 mm.

Guiana.

Hyria complanata HUPÉ, Moll. Nouv., III, 1857, p. 80, pl. XV, fig. 3.—SOWERBY, Conch. Icon., XVII, 1869, pl. IV, fig. 9.

Hyria syrmatophora KUSTER, Conch. Cab. Unio, 1856, p. 141, pl. XLI, fig. 4.

Prisodon complanatus SIMPSON, Syn., 1900, p. 870.

This species seems to differ from the *syrmatophorus* in having a much lower, widely rounded posterior ridge, which ends below in a widely rounded point a little above the base of the shell. The pseudocardinals are more strongly striate and it is probably darker colored, as a rule, than *syrmatophorus*.

PRISODON ALATUS (Sowerby).

Shell irregularly triangular, somewhat inflated, slightly inequilateral; dorsal outline strongly incurved, carried out into a narrow elongated wing in front and into a wide, much produced, upcurved wing behind; beaks low and not much swollen; posterior ridge apparently angled, but slightly elevated, ending in a widely rounded projection at some distance above the base; base much rounded; anterior end narrowed, cut away and rounded below, its outline sinuous; posterior end greatly incurved in the middle; surface nearly smooth, olive-brown.

Length from tip to tip of wings 115, from tip of front wing to post-basal point 115, extreme height 85 mm.

Guiana.

Hyria alata SOWERBY, Conch. Icon., XVII, 1869, pl. v, fig. 13.
Prisodon alatus SIMPSON, Syn., 1900, p. 871.

A form, which seems to have had a most rampant development. The wings are excessively produced, the outlines below them are greatly incurved. The base line is rounded; the lower posterior part of the shell is likewise rounded.

PRISODON CASTELNAUDI (Hupe).

Shell large, triangular, convex or subinflated, inequilateral, quite solid; beaks rather full and high; posterior ridge rounded, having a blunt, rounded termination near the base; base line elongated, very slightly curved; anterior end greatly narrowed, rather sharply winged; dorsal outline nearly straight, being produced into a wing behind the beaks; dorsal slope obliquely truncate, shorter than the dorsum; surface rather strongly, concentrically wrinkled; epidermis yellowish-green; pseudocardinals somewhat compressed, and, with the laterals, vertically striate; nacre white, bluish or iridescent on the border.

Length 143, height 90, diam. 45 mm.

Brazil.

Hyria castelnaudi HUPE, Moll. Nouv., III, 1857, p. 81, pl. XVI, fig. 1.—SOWERBY, Conch. Icon., XVII, 1869, pl. IV, fig. 8.
Prisodon castelnaudi SIMPSON, Syn., 1900, p. 871.

This may be only a form of *obliquus*, but its outline is almost triangular, the base forming the longest side, the dorsum, the next longest, and the dorsal slope the shortest. The blunt, posterior point is at the base of the shell instead of being elevated as in *obliquus*. According to Hupe it must be more ponderous than that species.

Prisodon obliquus Schumacher.

Shell large, elongated, irregularly sutriangular, inequilateral, solid; beaks full but not greatly elevated; dorsal outline straight, slightly incurved or curved upwards in the middle, ending in a sharp, narrow wing in front and a blunt one behind; posterior ridge well developed, narrowly rounded, sometimes semi-double below, ending in a point at some distance above the base; surface rather strongly, concentrically sculptured, with traces of radial sculpture; the young shells are sometimes plicate on the upper part of the dorsal slope; epidermis pale to dark tawny or brownish, often tinted green, shining; pseudocardinals compressed, elongated, split up and ragged; laterals remote; muscle scars impressed; nacre flesh-colored.

Length 165, height 80, diam. 43 mm.

Amazon drainage; southward through Brazil.

Prisodon obliquus Schumacher, Ess. Nouv. Syst., 1817, p. 139, pl. xl, fig. 2.—Simpson, Syn., 1900, p. 871.

Hyria obliqua Pætel, Conch. Sam., III, 1890, p. 189.

Hyria avicularis Lamarck, An. sans Vert., VI, 1819, p. 82.—Crouch, Ill. Int. Lam., 1827, p. 16, pl. ix, figs. 5*a*, 5*b*.—Wyatt, Man. Conch., 1838, p. 67, pl. v, fig. 4.—Delessert, Rec. Coq. Lam., 1841, pl. xii, fig. 9.—Hanley, Biv. Shells, 1843, p. 214, pl. xxiv, fig. 11.—Troschel, Arch. für Nat., XIII, Pt. 1, 1847, p. 271, pl. vi; fig. 3.—Chenu, Man., 1859, II, p. 149, fig. 734.—Sowerby, Conch. Icon., XVII, 1869, pl. iii, figs. 6*a*, *b*.

Unio avicularis Deshayes, Tr. El. Conch., 1839, p. 18, pl. xxix, figs. 10, 11.

Hyria avicularia Guerin, Icon. Reg. An., 1844, II, pl. xxviii, fig. 8.

Unio caudatus Wagner, Test. Fluv. Bras., 1827, p. 35, pl. xxvii, figs. 1, 2.

Diplodon furcatum SPIX, Test. Fluv., Bras., 1827, p. 35, pl xxvii, figs. 1, 2.

Hyria elongata SWAINSON, Ex. Conch., 1841, p. 29, pl. xxiv.

Triquetra elongata H. and A. ADAMS, Gen. Rec. Moll., II, 1857, p. 508.

This species is considerably elongated; the post-basal point is elevated to some distance above the base line; the base is somewhat rounded. In young shells the posterior wing is often greatly produced and elevated and the outline of the dorsal slope is much incurved, but in old specimens the wing is low and worn away behind.

PRISODON RECTUS (Sowerby).

Shell elongated, solid, strongly winged before and behind, inequilateral; beaks full and somewhat elevated; posterior ridge semi-double, elevated, ending behind in a faint biangulation at the base of the shell; dorsal outline curved upward; anterior and posterior wings extended; outline of dorsal slope greatly incurved above; outline of anterior end incurved under the wing, rounded and cut away below; base line nearly straight; surface irregularly, concentrically striate; epidermis chestnut-colored.

Length 130, height 53 mm.

South America; locality unknown.

Hyria recta SOWERBY, Conch. Icon., XVII, 1868, pl. v. fig. 10.

Prisodon rectus SIMPSON, Syn., 1900, p. 871.

An elongated, almost rhomboid form with considerably produced wings; the dorsal and basal outlines being nearly straight and parallel. The posterior ridge seems to be elevated above the rest of the shell.

PRISODON BROWNIANUS (Lea).

Shell rather small, elongated, subrhomboid, inflated, subsolid to solid, inequilateral; beaks full and high; posterior ridge strong, narrowly rounded, ending in a blunt point at the base of the shell; dorsal line nearly straight, scarcely winged before or behind; surface with strong, concentric growth lines and traces of radial sculpture, greenish-brown, somewhat shining; pseudocardinals much split, subradial; nacre soiled white.

Length 52, height 28, diam. 23.5 mm.
Length 61, height 39, diam. 24 mm.

Amazon River.

Unio brownianus LEA, Tr. Am. Phil. Soc., 1838, p. 108, pl. XXIV, fig. 116; Obs., II, 1838, p. 108, pl. XXIV, fig. 116.

Margarita (Unio) brownianus LEA, Syn., 1838, p. 13.

Prisodon brownianus SIMPSON, Syn., 1900, p. 871.

Hyria browniana SOWERBY, Conch. Icon., XVII, 1869, pl. V, fig. 12.

Margaron (Triquetra) browniana LEA, Syn., 1852, p. 17; 1870, p. 26.

Triquetra browniana H. and A. ADAMS, Gen. Rec. Moll., II, 1857, p. 508.

Two specimens, the type and another, from the Lea collection are before me and they differ decidedly in several characters. The type is the smaller, very solid, much inflated, and has strong, much split, elongated pseudocardinals. The other is larger, less inflated, thinner and has rather small pseudocardinals. Its small size, subrhomboid form, and the almost total absence of wings will distinguish it.

Subgenus HYRIANA Simpson, 1900.

Hyriana SIMPSON, Syn., 1900, p. 872.

Shell solid, compressed, elliptical, with a slight posterior dorsal wing, and a strong one anteriorly, a well-defined but low posterior ridge ending in a point well above the base, inflated at post-basal region, distinctly sulcate; beaks low, apparently not rayed; epidermis shining, light yellowish-brown; hinge line evenly curved; pseudocardinals numerous, much split into denticles and crooked; two laterals in the left valve and one (no doubt) in the right; beak cavities very shallow; dorsal scars numerous, anterior scars deep; nacre whitish, radially grooved along the pallial line.

Type, *Unio ortonii* Lea.

Prisodon ortonii Lea.

Shell irregularly obovate or elliptical, compressed, solid, very inequilateral; beaks apparently rather low and little inflated; posterior ridge not greatly elevated, very narrowly rounded, ending in a blunt point just below the median line; dorsal and basal outlines rounded; anterior end with a wing above; post-dorsal region almost wingless; surface with moderately strong, concentric ridges; epidermis pale brownish; pseudocardinals split into a number (in the left valve 8) of denticles, which run in a sinuous direction across the hinge plate; laterals of left valve two, curved; anterior scars, impressed; nacre bronzy, iridescent.

Length 135, height 79, diam. 33 mm.

River Napo, Ecuador.

Unio ortonii Lea, Pr. Ac. N. Sci. Phila., XII, 1868, p. 161; Jl. Ac. N. Sci. Phila., VI, 1868, p. 321, pl. LII, fig. 134; Obs., XII, 1869, p. 81, pl. LII, fig. 134.

Margaron (Unio) ortonii Lea, Syn., 1870, p. 28.

Prisodon ortonii Simpson, Syn., 1900, p. 872.

I have seen only a single left valve of this, the type. The anterior wing is gone and the epidermis is somewhat eroded. The shell has been injured when young, which has probably caused a long, low, radial furrow that runs in front of the posterior ridge. The space occupied by the pseudocardinals is not so long proportionally as in typical *Prisodon*.

Genus DIPLODON Spix, 1827.

Diplodon Spix, Test. Fluv. Bras., 1827, p. 33, pl. XXVI.

Shell elliptical, rounded, elongated or trapezoidal, with rather low beaks, which are more or less distinctly radially sculptured, the ridges usually curved and approaching below, with a low or scarcely developed posterior ridge; surface slightly, concentrically sculptured, sometimes broken into fine nodules or corrugations; epidermis dull, rayless; hinge with two compressed pseudocardinals in the right valve and one slender lateral and two compressed pseudocardinals, one in front of the other, and two laterals in the left valve; nacre bluish to white, dull, often blotched; beak cavities shallow; dorsal scars numerous, forming a row in the beak cavity parallel with the hinge line.

Animal with the marsupium occupying nearly the whole length of the inner branhiæ, a few ovules sometimes being found in the outer gills; branchiæ rather large, angular at base, inner much the larger, united their whole length to the abdominal sac; palpi scarcely or somewhat projecting posteriorly; mantle very thin, thickened on the edges; branchial opening papillose, separated from the smooth anal opening by a strong bridge; superanal opening not closed below.

Type, *Diplodon ellipticum* Spix.

KEY TO GROUPS OF DIPLODON.

On account of the similarity of characters of a large proportion of the forms of this genus and the fact that the beak sculpture is eroded away in nine-tenths of the specimens, it does not seem possible to me to construct a key that will lead to the species. For the same reasons I fear that the following key to the groups will not prove very satisfactory.

Shell generally short.
Having radial beak sculpture.
Obovate to suborbicular.
Moderately solid. Sect. *Cyclomya.*
Rather thin. Sect. *Bulloideus.*
Subquadrate, inflated. Group of *D. quadrans.*
Without radial beak sculpture. Subgenus *Lævirostris.*
Shell more or less elongated.
Beak sculpture of broken lines.
Shell elliptical or subtrapezoid.
Rather solid, bars of beak sculpture strong, slightly coalescing below. Group of *D. lacteolus.*
Thin or scarcely solid, bars of beak sculpture narrow, not coalescing. Group of *D. granosus.*
Posterior ridge high; shell pointed behind; beak sculpture of strong narrow ribs.
Group of *D. burroughianus.*

Shell elongated, subtrapezoidal, inflated.
Group of *D. parallelipipedon.*
Beak sculpture of broken, curved bars.
Beak sculpture strong, irregular, extending over the disk. Group of *D. dorsuosus.*
Beak sculpture moderate, of small area.
Shell covered with pustules.
Group of *D. novæhollandiæ.*
Shell scarcely or not at all nodulous.
Oval to elliptical. Group of *D. menzeizi.*
Long, rhomboid. Group of *shuttleworthii.*

Subgenus DIPLODON s. s.

Beak sculpture consisting of unbroken ridges, covering the whole beaks.

Animal having the labial palpi rounded below and at posterior base, scarcely projecting behind.

Type, *Diplodon ellipticum* Spix.

Group of *Diplodon lacteolus.*

Shell elliptical to subtrapezoidal, inflated, subsolid, with a low posterior ridge, sometimes having a slight posterior dorsal wing; one or two central pairs of bars of the beak sculpture usually joining below; pseudocardinals, sometimes slightly dentellate.

Animal having the characters of the genus.

DIPLODON LACTEOLUS (Lea).

Shell solid, unevenly elliptical or subrhomboid, subinflated, inequilateral, with a full rounded posterior ridge, which ends behind below the median line; beaks moderately full, raised but little above the dorsal border, sculptured with strong, radial ridges; surface irregularly sulcate; epidermis yellowish or greenish-brown, sometimes dark brown, dull or slightly shining; left valve with two subcompressed, but strong, pseudocardinals, which are often rough and split up, and two curved laterals, the lower stronger; right valve with two pseudocardinals, the upper compressed, the lower often split, with a deep scar at their bases, with one lateral; beak cavities shallow, showing a few, large dorsal pits; muscle scars irregular; nacre white, sometimes having a dull purplish tint, thicker in front.

Length 80, height 50, diam. 30 mm.

Length 72, height 42, diam. 26 mm.

Length 83, height 56, diam. 35 mm.

Argentina; Paraguay; Uruguay; Southern Brazil.

? Unio delodonta LAMARCK, An. sans Vert., VI, 1819, p. 77.—DELESSERT, Rec. Coq. Lam., 1841, pl. XII, fig. 7.—CHENU, Ill. Conch., 1858, pl. XII, figs. 1, 1*a*.

Margarita (Unio) delodontus LEA, Syn., 1836, p. 26; 1838, p. 20.

Unio delodontus HANLEY, Biv. Shells, 1843, p. 194, pl. XXI, fig. 56.—KUSTER, Conch. Cab. Unio, 1861, p. 234, pl. LXXVIII, fig. 5.

Margaron (Unio) delodontus LEA, Syn., 1852, p. 29; 1870, p. 46.

Diplodon delodontus SIMPSON, Syn., 1900, p. 873.

Unio delodon STROBEL, Mat. Mal., Pt. 1, 1874, p. 71.

Unio lacteolus LEA, Tr. Am. Phil. Soc., V, 1834, p. 40, pl. VIII, fig. 19; Obs., I, 1834, p. 152, pl. VIII, fig. 19.

I am unable to decide what Lamarck's *delodontus* is from his brief Latin description. Dr. Lea examined Lamarck's shells and suspects that the *delodontus* equals his *lacteolus*, but is not sure of it. I think under the circumstances it would be best to use Lea's name, as his species is properly described and figured, while Lamarck's description gives no locality or account of radial beak sculpture. The species is a very variable one and appears to be abundant over a wide region. There is much variation in form, inflation, solidity, color and character of the pseudocardinals. After carefully comparing Lea's *wheatleyanus* with a lot of shells recently received from Southern Brazil I am doubtful whether it should be separated from *lacteolus*.

DIPLODON WHEATLEYANUS (Lea).

Shell subrhomboid, subinflated, solid, inequilateral; beaks not full or high, sculptured with very strong, radial ridges; posterior ridge well developed, subangular, ending below in a blunt point near the base of the shell; surface rudely and unevenly, concentrically sculptured, with traces of radial sculpture, somewhat plicate on the posterior slope; epidermis brownish-green, sub-shining; left valve with two subcompressed, ragged pseudocardinals and two laterals, the inner higher; right valve with two pseudocardinals, the upper small and compressed, and one somewhat double lateral; dorsal scars numerous and deep; anterior adductor scars small, behind them a deep crescentic scar on the base of the pseudocardinals; nacre white, slightly thicker in front.

Length 70, height 47, diam. 30 mm.

Argentina.

Unio wheatleyanus LEA, Pr. Ac. N. Sci. Phila., VIII, 1856, p. 94; Obs., VI, 1857, p. 28, pl. XXIX, fig. 23; Jl. Ac. N. Sci. Phila., 1858, p. 308, pl. XXIX, fig. 23.—SOWERBY, Conch. Icon., XVI, 1868, pl. XL, fig. 487.

Margaron (Unio) wheatleyanus LEA, Syn., 1870, p. 50.

Diplodon wheatleyanus SIMPSON, Syn., 1900, p. 875.

DIPLODON RHOMBEUS (Wagner).

"Shell round-ovate or oblong-ovate, inflated in front, narrow behind, solid, transversely striate or sulcate; anterior end neither angulate nor plicate. Dorsal margin oblique, curved; beaks anterior, not very high. Anterior margin obliquely truncate, posterior rounded. Hinge curved; cardinal tooth heavy, compressed, bifid, striate; laterals substriate, single in the left valve, double in the right. Beaks depressed, eroded. Umbones plano-convex. Interior of the shell smooth, shining, pearly. Posterior muscular impression distinct, with two smaller ones adjacent, anterior shallow. Epidermis brown; nacre bluish-white.

Length 3, height 2.1 inches." (Wagner).

Brazil.

Unio rhombeus WAGNER, Test. Fluv. Bras., 1827, p. 34, pl. XXVIII, figs. 1, 2.—HANLEY, Biv. Shells, 1843, p. 208, pl. XXII, fig. 20.

Margarita (Unio) rhombeus LEA, Syn., 1836, p. 39; 1838, p. 25.

Margaron (Unio) rhombeus LEA, Syn., 1852, p. 38; 1870, p. 61.

Diplodon rhombeus SIMPSON, Syn., 1900, p. 873.

"The form of this species differs greatly in the height of the beaks. It is distinguished from *Unio peruvianus* Lam. by being neither plicate nor angulate."

DIPLODON PAULISTA (von Ihering).

"Shell sulcate, elliptical, inequilateral, rounded in front, posteriorly obtusely angulated and rounded. Not very thick; beaks rather low, with undulating, radiate folds on the anterior and posterior slopes near the apices. Epidermis green or brownish-green, without rays. Cardinal teeth lamellar, thick; laterals rather long, curved, or nearly straight. Nacre bluish-white either dull or iridescent.

Length (males) 48-51, height 59-60, diam. 31 mm.

Length (females) 54-57, height 61-65, diam. 32-35 mm.

The beaks are situated at from .22 to .26 of the length and the hinge at from .64 to .72 of the length." (von Ihering).

Sao Paulo, Brazil.

Unio paulista VON IHERING, Arch. für Nat., 1893, p. 93, pl. IV, fig. 7.

Diplodon paulista SIMPSON, Syn., 1900, p. 873.

"*Unio paulista* differs from *U. coriaceus* Dkr. resp. *multistriatus* Lea, in the less wrinkled and bright green epidermis and in the low development and granulation of the secondary radial striæ. *U. psammactinus* Bronn is a similar species, but in that the epidermis is a darker olive-brown with stronger growth-lines and the numerous, fine, radial striæ spread down widely over the posterior slope and the umbonal fold. Finally this species is also related to *U. greeffeanus,* but that species is larger, with a darker epidermis, without granulation in front of the beaks and with less sharply marked sexual dimorphism."

DIPLODON AMPULLACEUS (Lea).

"Shell smooth, oblong, very much inflated, inequilateral, obtusely angular behind and rounded before; substance of the shell somewhat thick, thicker before; beaks prominent and inflated; ligament rather small and dark brown; epidermis dark brown, rugosely striate, without rays and with rather distant marks of growth; umbonial slope rounded and much inflated; posterior slope elliptical, somewhat carinate, rather wide, very dark brown and with an impressed line in each valve; cardinal teeth small, oblique, lamellar and double in both valves; lateral teeth long, nearly straight, and corrugate; anterior cicatrices confluent and slightly impressed; dorsal cicatrices placed across the cavity of the beaks; cavity of the shell deep and rounded; cavity of the beaks very shallow and rounded; nacre white and iridescent.

Length 2.5, height 1.5, diam. 1.1 in." (Lea).

South America.

Unio ampullaceus LEA, Pr. Ac. N. Sci. Phila., X, 1866, p. 34; Jl. Ac. N. Sci. Phila., VI, 1868, p. 269, pl. XXXV, fig. 83; Obs., XII, 1869, p. 29, pl. XXXV, fig. 83.

Margaron (Unio) ampullaceus LEA, Syn., 1870, p. 53.

Diplodon ampullaceus SIMPSON, Syn., 1900, p. 874.

"A single specimen only of this species was received. The beaks are much eroded, but still an indistinct indication remains of the divergent character of the tips. In outline it is closely allied to *mexicanus* Phil., but differs entirely in the teeth and the color of the nacre. It is also very near to *charruanus* d'Orb., but is more inflated and not so wide. It reminds one of *blandingianus* (nobis), but is more quadrate than that shell and more oblique. In the specimen before me there are slightly impressed lines running from the beaks to the anterior half of the margin, which give the surface a rugose character. There is also a slight emargination at the posterior basal margin, which may not pertain to all other specimens."

DIPLODON WYMANII (Lea).

Shell large, subrhomboid, solid, subinflated, inequilateral, with moderately full, slightly raised beaks having uneven, radial sculpture; posterior ridge high, rounded, ending in a blunt point behind about at the base of the shell; above it on the posterior slope there is a wide, shallow, radial depression; surface with fine, concentric growth lines; epidermis chestnut-color, shaded with green at the umbonal region, smooth and shining except on the somewhat roughened border; left valve with two radial pseudocardinals, which are much split up and one granular lateral, with a vestige of a second above it; right valve with two pseudocardinals, the lower greatly divided, the upper compressed; behind these there is a vestigial tooth, and one somewhat double, granular lateral; dorsal scars large; anterior scars deep; posterior scars well-impressed; nacre white, almost silvery, thickened in front and iridescent behind.

Length 101, height 66, diam. 40 mm.

Uruguay River; South America.

Unio wymanii LEA, Pr. Ac. N. Sci. Phila., IV, 1860, p. 90; Jl. Ac. N. Sci. Phila., VI, 1863, p. 381, pl. XLII, fig. 289; Obs., X, 1863, p. 17, pl. XLII, fig. 289.—SOWERBY, Conch. Icon., XVI, 1868, pl. LXXXIV, fig. 449.

Margaron (Unio) wymanii LEA, Syn., 1870, p. 35.

Diplodon wymanii SIMPSON, Syn., 1900, p. 874.

Unio apprimus LEA, Pr. Ac. N. Sci. Phila., X, 1866, p. 34; Jl. Ac. N. Sci. Phila., VI, 1868, p. 263, pl. XXXIII, fig. 78; Obs., XII, 1869, p. 23, pl. XXXIII, fig. 78.

Margaron Unio apprimus LEA, Syn., 1870, p. 46.

Diplodon apprimus SIMPSON, Syn., 1900, p. 874.

This is perhaps the finest *Diplodon* known. It is a solid, rhomboid shell with a fine, shining chestnut epidermis, the surface delicately concentrically sculptured above, the sculpture becoming more rude on the border. The pseudocardinals are much split up; the nacre is white and fine. I am now convinced that Lea's *U. wymani* and *apprimus* are identical.

DIPLODON EXPANSUS (Kuster).

"Shell subovate, convex, solid, irregularly striate, shining, reddish-brown, rounded in front, subtruncate behind; umbones flat, eroded; dorsal slope compressed, obtusely angulated; cardinal teeth rather stout, trifid in the left valve; laterals moderate, somewhat curved; nacre white.

Length 52, height 31, diam. 16.5 mm." (Kuster).

Type locality, "Rio Conigo, near New Freiberg, Brazil."

Unio expansus KUSTER, Conch. Cab. Unio, 1856, p. 149, pl. XLIII, fig. 5.

Diplodon expansus SIMPSON, Syn., 1900, p. 874.

I know nothing of this. It looks more like an Australian than a South American form, and is quite likely a *D. australis*.

DIPLODON PECULIARIS (Lea).

"Shell smooth, quadrate, somewhat compressed at the sides and inflated on the umbonal slope; inequilateral, obtusely angular behind, rounded before; substance of the shell somewhat thick, slightly thicker before; beaks a little prominent, slightly inflated with divergent folds at the tips; ligament small and very dark; epidermis greenish-brown, without rays and with very indistinct lines of growth; umbonal slope inflated and rounded; posterior slope narrow, elliptical, with an indistinct impressed line in each valve; anterior cicatrices confluent, rather small and slightly impressed; posterior cicatrices confluent, large and very slightly impressed; dorsal cicatrices in a row across the centre of the cavity of the beaks; cavity of the shell shallow and wide; cavity of the beaks very shallow and rounded; nacre bluish-white and iridescent.

Length 2, height 1.3, diam. .9 in." (Lea).

Paraguay.

Unio peculiaris LEA, Pr. Ac. N. Sci. Phila., X, 1866, p. 33; Jl. Acad. N. Sci. Phila., VI, 1868, p. 265, pl. XXXIV, fig. 80; Obs., XII, 1869, p. 25, pl. XXXIV, fig. 80.

Margaron (Unio) peculiaris LEA, Syn., 1870, p. 47.

Diplodon peculiaris SIMPSON, Syn., 1900, p. 874.

Unio paraguayensis LEA, Pr. Ac. N. Sci. Phila., X, 1866, p. 34; Jl. Ac. N. Sci. Phila., VI, 1868, p. 271, pl. XXXV, fig. 85; Obs., XII, 1869, p. 31, pl. XXXV, fig. 85.

Margaron (Unio) paraguayensis LEA, Syn., 1870, p. 45.

? *Unio nitidulus* KUSTER, Conch. Cab. Unio., 1848, p. 226, pl. LXXVI, fig. 6.

"In outline *peculiaris* is near to *bengalensis* (nobis), but in other respects it is very different, having divergent folds on the beaks, a white and thicker nacre, etc. Of all the South American species, with which I am acquainted, it most closely resembles *wymanii* (nobis), but may be easily distinguished by its darker epidermis, its greater inflation and in being a smaller species. There is a slight indication of triplication of the cardinal tooth of the left valve in both the specimens."

DIPLODON FIRMUS (Lea).

"Shell smooth, elliptical, somewhat inflated, very inequilateral, rounded before and behind; substance of the shell rather thick, thicker before; beaks slightly prominent; ligament rather long and light brown; epidermis greenish-brown, without rays, with distant marks of growth; umbonal slope rounded and inflated; posterior slope narrow, elliptical, and very slightly carinate, with indistinct impressed lines in each valve; cardinal teeth somewhat thick, compressed and double in both valves; lateral teeth long, lamellar and somewhat curved; anterior cicatrices confluent, rather small and deeply impressed; posterior cicatrices confluent, large and slightly impressed; dorsal cicatrices placed in a row across the centre of the cavity of the beaks; cavity of the shell rather shallow and wide; cavity of the beaks shallow and rounded; nacre silver-white and very iridescent.

Length 2.4, height 1.4, diam. 1 in." (Lea).

Brazil.

Unio firmus LEA, Pr. Ac. N. Sci. Phila., X, 1866, p. 33; Jl. Ac. N. Sci. Phila., VI, 1868, p. 267, pl. XXXIV, fig. 82; Obs., XII, 1869, p. 27, pl. XXXIV, fig. 82.

Margaron (Unio) firmus LEA, Syn., 1870, p. 45.

Diplodon firmus SIMPSON, Syn., 1900, p. 874.

"In outline *firmus* is closely allied to *caliginosus* (nobis), but it is a heavier species, with a brighter nacre and a less dark epidermis. In the specimens before me the nacre is much worn and the substance of the shell eroded. The beaks are so much eroded that there are no remains of divergent folds, with which they were, no doubt, once clothed. It is nearly allied to *paraguayensis* herein described, but differs much in the elliptical outline."

Var. *bœttgeri* (von Ihering).

"Shell lower, with the posterior end subrostrate and angulated." (von Ihering).

San Paulo, Brazil.

Unio firmus Lea var. *bœttgeri* von Ihering, Arch. für Nat., 1893, p. 105, pl. iv, fig. 11.

Diplodon firmus var. *bœttgeri* Simpson, Syn., 1900, p. 874.

Diplodon uruguayensis (Lea).

Shell subrhomboid, somewhat inequilateral, with full but not high beaks; posterior ridge full and rounded, ending behind in a rounded point near the base of the shell; posterior slope hollowed out; surface finely, concentrically sculptured; epidermis greenish and brownish, somewhat banded, the hinder half of the shell darker; left valve with one compressed, very rough pseudocardinal and two straight laterals; right valve with two compressed pseudocardinals, the upper small, and one lateral; anterior muscle scars small, impressed; nacre white, tinted blue, thicker in front.

Length 70, height 45, diam. 30 mm.

Uruguay River, South America.

Unio uruguayensis Lea, Pr. Ac. N. Sci. Phila., IV, 1860, p. 90; Jl. Ac. N. Sci. Phila., V, 1863, p. 388, pl. xlv, fig. 298; Obs., X, 1863, p. 24, pl. xlv, fig. 298.—Sowerby, Conch. Icon., XVI, 1868, pl. lxxxiv, fig. 448.

Margaron (Unio) uruguayensis Lea, Syn., 1870, p. 46.

Diplodon uruguayensis Simpson, Syn., 1900, p. 875.

Very close to *D. wymanii* and possibly only the young of that. It differs in having the peculiar dark posterior end, the coloring of which seems to be a very wide, feeble ray, and in the teeth. The pseudocardinals of *D. wymanii* are subradial and much split, those of this species are compressed and not split; the laterals of *wymanii* are curved and granular, those of *uruguayensis* are straight and nearly smooth.

DIPLODON RUDUS (Lea).

"Shell smooth, elliptical, thick, inflated, inequilateral, emarginate behind, obliquely rounded before; substance of the shell thick and ponderous, thicker before; beaks thick and prominent; ligament rather short, thick and light brown; epidermis dark brown, lighter towards the beaks, roughly striate, the marks of growth being rather close and irregularly impressed into furrows, which are crossed by a few, indistinct, impressed furrows from the beaks to the margin; umbonal slope raised and rounded; posterior slope broad, rather flat, with a low keel rising from a deep, broad furrow; cardinal teeth rather small, somewhat elongate, striate, crenulate, and double in both valves; lateral teeth somewhat long, rather thick, granulate, thickened towards the end and curved; anterior cicatrices distinct, large and deeply impressed; posterior cicatrices confluent, rather large and well impressed; dorsal cicatrices well impressed and placed in a row across the centre of the cavity of the beaks; pallial cicatrix irregular and deeply impressed; cavity of the shell deep and rounded; cavity of the beaks rather deep and subangular; nacre white, disposed to be pinkish at the anterior margin and iridescent.

Length 3, height 2.2, diam. 1.4 in." (Lea).

Rio de la Plata.

Unio rudus LEA, Pr. Ac. Nat. Sci. Phila., III, 1859, p. 187; Jl. Ac. Nat. Sci. Phila., IV, 1860, p. 266, pl. XLIII, fig. 146; Obs., VII, 1860, p. 84, pl. XLIII, fig. 146.—KUSTER, Conch. Cab. Unio, 1861, p. 261, pl. LXXXVIII, fig. 1.

Margaron (Unio) rudus LEA, Syn., 1870, p. 50.

Unio rudis PÆTEL, Conch. Sam., III, 1890, p. 166.

Diplodon rudus SIMPSON, Syn., 1900, p. 875.

"There was a single specimen only of this species sent to me by Dr. Von dem Busch. It is much stouter than *Uniones* are usually from South America, and perhaps is more nearly allied to *wheatleyanus*, (nobis), from the Rio Negro than any other species. It approaches to *delodontus* Lam., but is thicker and more rotund than that species. It may be distinguished at once from *wheatleyanus* by its greater thickness, by the swollen beaks, the furrow on the posterior slope and the size and form of the cardinal teeth, which are peculiar in this. The beaks of this specimen being much eroded, it is impossible to say what may be the character of the tips, but they are likely to have rayed ribs, like most South American *Unionidæ,* but not so much so as in *wheatleyanus.* The specimen before me, as described above, is rugose, with a few irregular transverse and radiating furrows, which may not exist on all specimens. It is dark brown and roughly striate near the margin, and smoother and light brown towards the beaks."

DIPLODON GREEFFEANUS (von Ihering).

"Shell sulcate, elliptical or suboblong, inequilateral, rather compressed, rounded before, obtusely angulate behind; valves rather thick; beaks not prominent, with accessory, radiate, undulating striæ on the posterior slope. Epidermis greenish-brown, obsoletely radiate. Cardinal teeth long, lamellar rather stout; laterals long and somewhat curved. Nacre silvery, moderately iridescent.

Length 64, height 39, diam. 22 mm. Beaks situated at 1-4 of the length." (von Ihering).

Sao Paulo, Brazil.

Unio greeffeanus VON IHERING, Arch. für Nat., 1893, p. 96, pl. IV, fig. 8.

Diplodon greefianus SIMPSON, Syn., 1900, p. 875.

DIPLODON PIGER (Lea).

Shell subrhomboid or obovate, subsolid, inflated, inequilateral, with full but low beaks, having radial sculpture; post-dorsal part slightly winged, the wing ending in an angle caused by the truncation of the posterior slope; posterior ridge well developed, subangular, ending behind in a blunt point near the base of the shell; base and anterior end rounded, the latter with an obtuse angle above; surface with fine concentric sculpture; epidermis olive, feebly banded, scarcely shining; left valve with one compressed pseudocardinal and a vestige of another in front of it, with two delicate, curved laterals, the lower higher; right valve with two curved, lamellar pseudocardinals, the upper small, and one lateral; dorsal scars large; muscle impressions shallow; nacre bluish-white.

Lengh 55, height 40, diam. 25 mm.

Uruguay River, South America.

Unio piger LEA, Pr. Ac. N. Sci. Phila., IV, 1860, p. 90; Jl. Ac. N. Sci. Phila., V, 1863, p. 387, pl. XLV, fig. 296; Obs., X, p. 23, pl. XLV, fig. 296.—SOWERBY, Conch. Icon., XVI, 1868, pl. LXXXIV, fig. 449.

Margaron (Unio) piger LEA, Syn., 1870, p. 46.

Diplodon piger SIMPSON, Syn., 1900, p. 875.

A neat, subinflated, finely concentrically sculptured species.

DIPLODON PRUNOIDES (Lea).

"Shell smooth, elliptical, very ventricose, inequilateral, rounded before and behind; substance of the shell rather thick, somewhat thicker before; beaks somewhat prominent; ligament rather short and thin; epidermis dark brown, without rays; umbonal slope raised and rounded; posterior slope wide and cordate; cardinal teeth compressed, oblique and very much crenulate, double in the right and disposed to be treble in the left valve; lateral teeth long, lamellar and corrugate; anterior cicatrices confluent, rather small and well impressed; posterior cicatrices confluent and slightly impressed; dorsal cicatrices placed nearly in the centre of the cavity of the beaks; cavity of the shell very deep and rounded; cavity of the beaks deep and rounded; nacre silver-white.

Length 2, height 1.3, diam. 1.1 in." (Lea).

South America. ?

Unio prunoides LEA, Pr. Ac. N. Sci. Phila., XII, 1868, p. 150; Jl. Ac. N. Sci. Phila., VI, 1868, p. 323, pl. LIII, fig. 136; Obs., XII, 1869, p. 83, pl. LIII, fig. 136.

Margaron (Unio) prunoides LEA, Syn., 1870, p. 47.

Diplodon prunoides SIMPSON, Syn., 1900, p. 875.

"A single specimen, which was found among several of *U. corrugata Lam.* in the collection of the Academy of Natural Sciences. I have little doubt but that it is a native of some of the rivers of South America. The beaks are very much eroded. If they were perfect in the specimen, their character would, I think, prove the truth of this suggestion. The character of the cardinal teeth is similar to some of the South American species. In the left valve it is treble, the anterior division being very small, the middle one being the largest. In the right valve the cardinal tooth is double. The anterior cicatrices are so confluent as to show no disposition to be separated. There is no appearance of this specimen ever having had rays, but it is very far from being a perfect individual, and young and perfect ones may be rayed."

DIPLODON BESKEANUS (Dunker).

Shell small, trapezoidal, subinflated, subsolid, inequilateral with rather low beaks, which are but little inflated, their sculpture radial; posterior ridge moderate, ending in a blunt point behind near the base, above it on the posterior slope there is a wide, shallow, radial depression, which ends in an emargination along the truncated border; dorsal line slightly curved, high behind; anterior end much narrowed and rounded; base line nearly straight; surface finely, concentrically striate; epidermis dark olive or olive-green, scarcely shining; left valve with a lamellar pseudocardinal and a vestige of another below and in front of it, with two delicate, remote laterals; right valve with two long pseudocardinals, the upper small, and one lateral; dorsal scars few, adductor scars small and superficial; nacre bluish-white, somewhat iridescent.

Length 38, height 25, diam. 15 mm.

Brazil.

Unio beskeanus DUNKER, Zeits. für Mal., V, 1848, p. 182.
Margaron (Unio) beskeanus LEA, Syn., 1870, p. 61.
Diplodon beskeanus SIMPSON, Syn., 1900, p. 875.

So far as I know this species has never been figured. There is in the Lea Collection a single shell labeled *Unio beskeanus* Dunker and presented by Dr. Dunker under that name, and from it I have drawn the above description. It is decidedly trapezoidal, being much wider behind than in front; the beaks are considerably eroded, yet vestiges of radial sculpture remain. It may be a young shell. It is near *suavidicus,* but is less solid and inflated and is smoother and more decidedly trapezoidal.

DIPLODON LOCELLUS (Lea).

"Shell smooth, elliptical, very much inflated, inequilateral, somewhat rounded before and subtruncate behind; substance of the shell thin; beaks rather prominent, swollen, with divergent folds at the tips; ligament very small and light brown; epidermis dark brown, obscurely rayed, with distant marks of growth, striate on the anterior half; umbonal ridge rounded and very much inflated; posterior slope elliptical, rather wide, with an indistinct furrow in each valve; cardinal teeth small, very much compressed, very oblique and double in both valves; lateral teeth rather small, nearly straight, thin and lamellar; anterior cicatrices confluent and slightly impressed; posterior cicatrices confluent and scarcely visible; dorsal cicatrices placed above the centre of the cavity of the beaks; cavity of the shell deep and wide; cavity of the beaks very shallow and rounded; nacre bluish-white and iridescent.

Length 1.8, height 1.2, diam. 8 in." (Lea).

Argentina.

Unio locellus LEA, Pr. Ac. N. Sci. Phila., X, 1866, p. 34; Jl. Ac. N. Sci. Phila., VI, 1868, p. 264, pl. XXXIII, fig. 79; Obs., XII, 1869, p. 24, pl. XXXIII, fig. 79.

Margaron (Unio) locellus LEA, Syn., 1870, p. 47.

Diplodon locellus SIMPSON, Syn., 1900, p. 876.

"Of this well characterized little species there was only a single specimen received. In outline it is near to *bengalensis,* (nobis), but it is more inflated, has larger teeth and a thicker and white nacre. It differs from *ampullaceus,* herein described, in being elliptical, more inflated over the umbones, and being a much lighter shell. The beaks well display the divergent folds at the tips, a character so well denoting its South American origin."

DIPLODON SUAVIDICUS (Lea).

"Shell smooth, oblong, somewhat compressed, very inequilateral, rounded before and truncate behind, dorsal and basal lines nearly parallel; swollen before the umbonal slope and flattened at the side; beaks a little prominent, with rather short divergent and re-entering ribs at the apex; ligament short and thin; epidermis yellowish-olive, minutely striate, apparently without rays; umbonal slope subangular; posterior slope raised nearly into a wing; cardinal teeth small, compressed, crenulate, oblique and double in both valves; lateral teeth long, lamellar, single in the right and double in the left valve; anterior cicatrices confluent; posterior cicatrices confluent; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the shell rather deep and rounded; cavity of the beaks rather shallow and angular; nacre bluish-white and very iridescent.

Length .8, height .6, diam. .4 in." (Lea).

Amazon.

Unio suavidicus LEA, Pr. Ac. N. Sci. Phila., VIII, 1856, p. 95; Obs., VI, 1857, p. 29, pl. XXIX, fig. 24; Jl. Ac. N. Sci. Phila., III, 1858, p. 309, pl. XXIX, fig. 24.

Margaron (Unio) suavidicus LEA, Syn., 1870, p. 54.

Diplodon suavidicus SIMPSON, Syn., 1900, p. 876.

"A single small specimen of this species, evidently quite young. I should suppose about one-fourth grown. The above diagnosis, therefore, may be found to be, in many respects, incorrect, when mature individuals shall be examined. The oblong outline of this shell is remarkably regular. The costæ of the beaks are smaller on the posterior and anterior slopes and several of them form re-entering angles on the posterior slope and on the sides. This species has some affinity to *charruanus* d'Orb., but differs in being more oblong, in having smaller costæ on the beaks and in having the posterior slope more elevated."

DIPLODON BROWNII (Lea).

Shell small, obovate, compressed, solid, inequilateral, with low, flat, strongly radially ribbed beaks; posterior ridge low but well defined, ending in a blunt point behind about on the median line; dorsal line high behind; dorsal slope subtruncate; anterior end narrow, rounded; base line curved, full behind; surface with fine concentric growth lines; epidermis bronzy-green, subshining; left valve with two rough pseudocardinals, the anterior small, and two laterals; right valve with two pseudocardinals, the upper small, with one lateral; dorsal pits deep; muscle scars small, shallow; nacre bluish-white.

Length 28, height 19, diam. 9 mm.

South America. ?

Unio brownii Lea, Pr. Ac. N. Sci. Phila., VIII, 1856, p. 95; Obs., VI, 1857, p. 27, pl. XXIX, fig. 22; Jl. Ac. N. Sci. Phila., III, 1858, p. 307, pl. XXIX, fig. 22.

Margaron (Unio) brownii Lea, Syn., 1870, p. 61.

Diplodon brownii Simpson, Syn., 1900, p. 876.

Dr. Lea had a single specimen of this shell, which he marked "Mocha?" It is, I am sure, a South American species close to *suavidicus*, as the beaks are strongly and regularly radially sculptured. It is more compressed and smoother than *suavidicus*, though having a similar outline. Two small shells, which Dr. Lea called *U. brownii*, are the former without doubt. The type of *brownii* is probably a young shell.

DIPLODON LEAI Simpson.

Shell small, subinflated, solid, inequilateral, subrhomboid, with full but not high beaks, which are badly eroded in the only specimen seen; posterior ridge full, widely rounded, ending behind in a rounded point near the base line; posterior slope truncated behind and angled above; surface closely, but feebly concentrically sculptured, showing traces of radial sculpture; epidermis dark brown, subshining; left valve with two somewhat split-up pseudocardinals, the anterior smaller, and two delicate laterals; right valve with one stronger dentilate pseudocardinal and a smaller smooth one above it, with one lateral; anterior scars large and impressed; nacre bluish-white, thicker in front.

Length 32, height 21, diam. 15 mm.

Brazil.

Margarita (Unio) modestus LEA, Syn., 1836, p. 32; 1838, p. 22.
Margaron (Unio) modestus LEA, Syn., 1852, p. 33; 1870, p. 54.
Unio modestus H. and A. ADAMS, Gen. Rec. Moll., II, 1857, p. 493.
Diplodon leai SIMPSON, Syn., 1900, p. 876.

It is a small, rather solid, inflated, rhomboid shell, with a brown epidermis, which scarcely shows a tint of green.

Lea credits this to Ferussac in his Synopsis, but I do not think it has ever been described by that author or anyone else. In 1856 Kuster properly described and figured a species in the Conchylien Cabinet (Vol. Unio, p. 147, pl. XLIII, fig. 2) under the name of *Unio modestus*, which he credits to Charpentier's manuscript, a different shell from that referred to by Lea and the Adams brothers. If the latter was never described the name *modestus* can not be used for it, as it was first properly applied to another species.

DIPLODON RHUACOICUS (d'Orbigny).

"Shell elongate-oblong, inflated, thick, smooth or concentrically rugose; epidermis greenish-brown; beaks radially costate; anterior end short, rounded; posterior end elongate, obtuse, obliquely truncate; within bluish-white.

Length 63 mm., compared with the length: height 51/100, diam. 43/100, length of posterior margin 67/100; apical angle 145°." (d'Orbigny).

Uruguay.

Unio rhuacoica d'ORBIGNY, Guer. Mag., 1835, p. 35; Voy. Am. Mer., 1843, p. 606, pl. LXIX, figs. 4, 5.
Margaron (Unio) rhuacoicus LEA, Syn., 1870, p. 54.
Diplodon rhuacoicus SIMPSON, Syn., 1900, p. 876.
Unio rhyacoicus VON MARTENS, Mal. Bl., XV, 1868, p. 195.
Monocondylæa rhyacoeca PÆTEL, Conch. Sam., III, 1890, p. 174.

"This species is rounded at the ends like *U. charruana*, but is to be distinguished by its shape, which is very much more elongated, narrower, with the dorsal and ventral margins parallel and also more inflated. It is possible, nevertheless, that this species, in spite of these differences found in a good number of specimens, may prove to be only a variety of *U. charruana*, with which it was found. We collected it in a brook near Maldonado and in the Rio Canelon grande, near Montevideo, Republic of Uruguay. It is rare."

DIPLODON CHARRUANUS (d'Orbigny).

Shell decidedly rhomboid, subinflated, solid, finely, concentrically striate; epidermis yellowish-brown; inequilateral, with a high, rounded posterior ridge, which ends behind in a rounded point at the base line; beaks rather full and high, strongly radially sculptured; left valve with a large, much split-up pseudocardinal and a somewhat double lateral; right valve having a similar split pseudocardinal and a double lateral; anterior scars impressed; nacre whitish, blotched in the cavities, thicker in front.

Length 63, height 35, diam. 24 mm.

Uruguay.

Unio charruana d'ORBIGNY, Guer. Mag., 1835, p. 35; Voy. Am. Mer., 1843, p. 606, pl. LXXI, figs. 8-14.

Margarita (Unio) charruanus LEA, Syn., 1838, p. 20.

Margaron (Unio) charruanus LEA, Syn., 1852, p. 29; 1870, p. 54.

Unio charruanus SOWERBY, Conch. Icon., XVI, 1868, pl. XCIII, figs. 505, 505*a*, 505*b*.

Diplodon charruanus SIMPSON, Syn., 1900, p. 876.

Unio faba d'ORBIGNY, Mag. Zool. 1835, p. 35; Voy. Am. Mer., 1843, p. 606, pl. LXXI, figs. 8-11.

Margarita (Unio) faba LEA, Syn., 1838, p. 21.

Margaron (Unio) faba LEA, Syn., 1852, p. 31; 1870, p. 50.

More decidedly rhomboid than *D. rhuacoicus*. The specimens in the Lea Collection, which were received from d'Orbigny under the name *Unio charruana*, are young and rather bronzy. In the larger the laterals are partially reversed.

DIPLODON CAIPIRA (von Ihering).

Shell oblong, subsolid, nearly evenly elliptical, subinflated, inequilateral, with a rather full, rounded posterior ridge, which ends behind at or below the median line; beaks moderately full, raised above the dorsal line, their sculpture not seen; growth lines rather strong, in some cases being elevated into slight, concentric ridges; epidermis dark olive, brown or black, scarcely shining; left valve with two lamellar pseudocardinals and two remote laterals; right valve with two compressed pseudocardinals, the upper smaller, and one lateral; dorsal scars numerous; muscle scars impressed; nacre bluish, a little thickened in front.

Length 55, height 29, diam. 22 mm.

Uruguay; Southern Brazil.

Unio caipira VON IHERING, Arch. für Nat., 1893, p. 98, pl. IV, fig. 9.

Diplodon caipira SIMPSON, Syn., 1900, p. 877.

A nearly evenly elliptical form, sometimes a little rhomboid, rather closely and finely, concentrically sulcate, and quite dark colored. It seems to be close to *D. ellipticus,* but is not so much pointed behind and lacks the post-basal inflation of that species.

DIPLODON PICEUS Lea.

"Shell smooth, elliptical, somewhat inflated, very inequilateral, somewhat rounded behind and obliquely rounded before; valves somewhat thick, slightly thicker before; beaks slightly prominent; epidermis shining, black, striate and obscurely rayed or without rays, with rather distant marks of growth; ligament small and dark brown; umbonal slope somewhat raised and rounded; posterior slope compressed, elliptical, with an obscure furrow on each valve; cardinal teeth rather small, compressed, lamellar, oblique, single in the left and double in the right valve; lateral teeth rather long, somewhat thin and curved; anterior cicatrices rather small, well impressed, confluent with the lower but distinct from the upper; posterior cicatrices confluent, rather large and slightly impressed; dorsal cicatrices well impressed and placed across the cavity of the beaks; cavity of the shell rather deep and wide; cavity of the beaks shallow and rounded; nacre bluish-white and iridescent.

Length 1.8, height 1.1, diam. .7 in." (Lea).

Uruguay River, South America.

Unio piceus LEA, Pr. Ac. N. Sci. Phila., IV, 1860, p. 91; Jl. Ac. N. Sci. Phila., V, 1863, p. 397, pl. XLI, fig. 287; Obs., X, 1863, p. 15, pl. XLI, fig. 287.

Margaron (Unio) piceus LEA, Syn., 1870, p. 53.

Diplodon piceus SIMPSON, Syn., 1900, p. 877.

"Three specimens. They all differ slightly in the ellipticity of outline. One being a little wider and the other not quite so much so as that figured. It is very near to *lugubris* (nobis) in outline and in the blackness of the epidermis, but in the nacre it differs entirely, as it does in the cardinal teeth. It is also very near in outline to *lepidus,* herein described. The single cardinal tooth in the left valve is very unusual. The blackness of the epidermis is very striking and apparently it is without rays. In looking through the valve the hue is greenish, and one of the specimens exhibits obscure rays. The beaks of all the three are eroded, and I cannot therefore describe the undulations of the tips. From indications in the exposed nacre I have no doubt that this species has diverging undulations at the tips. The transverse striæ are coarse, almost amounting to sulcations. The cardinals are nearly on the same curve with the lateral teeth."

DIPLODON SUPPOSITUS n. s.

Shell oblong, elliptical or subrhomboid, subcompressed, subsolid; posterior ridge nearly or entirely wanting; beaks rather low, their sculpture consisting of a number of short, straight, radial bars; surface with numerous fine growth lines; epidermis olive or brownish, bronzy, generally shining; left valve with two compressed pseudocardinals and two laterals; right valve with two pseudocardinals, the upper small, and one lateral, teeth all delicate; nacre bluish-white, thickened a little in front.

Length 50, height 26, diam. 14 mm.

Length 55, height 32, diam. 19 mm.

Southern Brazil, numerous localities.

Diplodon piceus (part), SIMPSON, Syn., 1900, p. 877.

A form with few decided characters, yet one which does not seem to quite equal any other. The young are often brilliant and of various shades of green, showing the closest relationship with many of the forms on the west side of the Andes. The older shells often have the dorsal and ventral lines almost parallel and a decidedly bronzy epidermis much like that of *D. auratus*.

This species was received from von Ihering under this name, but, so far as I have been able to ascertain, it has never been published.

DIPLODON WAGNERIANUS Simpson.

"Shell ovate-oblong, ventral margin slightly incurved; transversely sulcate, anterior end roundly attenuate, posterior narrow and rounded. Hinge consisting of one, heavy, crenulate and sometimes bifid cardinal tooth and two, compressed, elongate laterals in the right valve and two crenulate cardinals and a single, very long, very thin, crenulate lateral in the left. Beaks incurved, in young specimens with simple, longitudinal folds, in the adults eroded. Umbones plano-convex, not rugose. Margins acute, simple. Cavity smooth, shining, pearly. Epidermis olive-brown, nacre bluish.

Length 2.1, height 1 inch." (Wagner).

Type locality, Rio Sao Francesco, Brazil.

Unio ellipticus WAGNER, Test. Fluv. Bras., 1827, p. 33, pl. XXLI, figs. 1, 2.—KUSTER, Conch. Icon. Unio, 1861, p. 238, pl. LXXX, fig. 2.—SOWERBY, Conch. Icon., XVI, 1868, pl. LXXIV, fig. 382.

Margaron (Unio) ellipticus LEA, Syn., 1852, p. 21; 1870, p. 31.

? Diplodon wagnerianum SIMPSON, Syn., 1900, p. 877.

Barnes applied the name *Unio ellipticus* in 1823 to a species which is believed to be *ligamentina*. Wagner placed his shell in *Unio* in the text, but Spix called it *Diplodon ellipticum* in the plate.

Var. *santanus* von Ihering.

"Mr. Garbe collected numerous examples in the Rio Santa Maria, a tributary of the Rio Doce. The largest measures 42 mm. in length. The ventral margin runs nearly straight from the upper anterior end in a posterior and downward direction to the last quarter of the length of the shell, whence it again ascends. The angle in which the two parts of the ventral margin meet posteriorly is not as distinct as in the typical specimens collected by Spix in the Rio Sao Francisco. This reason and the somewhat smaller dimensions induce me to regard the specimens from the Santa Maria River as a distinct subspecies, which I name *santanus*." (von Ihering).

Diplodon ellipticus santanus VON IHERING, Abhandl. Senckenb. Naturf. Ges., 32, 1910, p. 134.

DIPLODON ÆTHIOPS (Lea).

Shell oblong, convex, subsolid, with a straight dorsal line, the posterior slope rather abruptly truncated, the basal line slightly curved; posterior ridge high, subangular; dorsal slope with a few, irregular wrinkles, beaks low, rather full, their sculpture not seen; surface with irregular, subsulcate sculpture; epidermis black, scarcely shining; left valve with two compressed, small, ragged pseudocardinals and two delicate laterals; right valve with two pseudocardinals, the upper very small and one straight lateral; nacre whitish, somewhat thicker in front.

Length 53, height 27, diam. 18 mm.

Uruguay and Paraguay Rivers; southern Brazil.

Unio æthiops LEA, Pr. Ac. N. Sci. Phila., IV, 1860, p. 91; Jl. Ac. N. Sci. Phila., V, 1863, p. 377, pl. XLI, fig. 285; Obs., X, 1863, p. 13, pl. XLI, fig. 285.

Margaron (Unio) æthiops LEA, Syn., 1870, p. 53.

Diplodon æthiops SIMPSON, Syn., 1900, p. 877.

I have only seen a single dead specimen, not in good condition, the type. The dorsal line is quite straight; the post-ridge is high and subangular, the dorsal slope has a few wrinkles and the epidermis is almost jet black throughout.

Var. *piracicabanus* (von Ihering).

"Valves thick; posterior extremity rounded; lateral teeth straight or slightly curved." (von Ihering).

Piracicaba, San Paulo, Brazil.

Unio æthiops Lea, var. *piracicabana* von Ihering, Arch. für Nat., 1893, p. 102.

Diplodon æthiops var. *piricicabana* Simpson, Syn., 1900, p. 877.

Diplodon divaricatus (Lea).

"Shell elliptical, transverse, somewhat compressed, very inequilateral; substance of the shell thin; beaks covered with beautiful folds diverging from their apex; ligament rather short and slender; epidermis greenish, smooth; cardinal teeth small, compressed, double in the right valve and single in the left; lateral teeth long, rather thin and nearly straight; anterior cicatrices slightly confluent; posterior cicatrices confluent; dorsal cicatrices situated in the centre of the cavity of the beaks; cavity of the beaks shallow and subangular; nacre white and iridescent.

Length 1.4, height .9, diam. .5 inches." (Lea).

South America.

Unio divaricatus Lea, Tr. Am. Phil. Soc., V, 1834, p. 64, pl. IX, fig. 24; Obs., I, 1834, p. 176, pl. IX, fig. 24.—Hanley, Biv. Shells, 1843, p. 197, pl. XXIII, fig. 36.

Margarita (Unio) divaricatus Lea, Syn., 1836, p. 29; 1838, p. 21.

Margaron (Unio) divaricatus Lea, Syn., 1852, p. 31; 1870, p. 49.

Diplodon divaricatus Simpson, Syn., 1900, p. 878.

Credited by Lea to Egypt, but no doubt a South American species, as it has radial beak sculpture and appears to belong to this group.

Diplodon perplexus n. s.

Shell long elliptical or subrhomboid, convex, inequilateral, rather solid, usually subtruncate in front; posterior slope curved or feebly truncate; posterior ridge low, rounded, ending behind in a rounded point a little below the median line; beaks scarcely inflated or elevated above the dorsal line, with numerous, strong, uneven, radial bars, the central pair coalescing below; surface with numerous, fine, concentric ridges; epidermis olive-green or brownish, somewhat shining, often showing the rest marks; left valve with one compressed pseudocardinal, sometimes with a small one in front, the lower surface of the tooth often excavated, and two slender laterals; right valve with two pseudocardinals, the lower larger and ragged and one lateral; dorsal scars small and numerous; anterior scars impressed; there is a small deep crescent-shaped scar at the base of the pseudocardinals; nacre bluish-white, often blotched, a little thickened in front.

Length 73, height 42, diam. 24 mm.

Lake Portero near Maldonado, Uruguay.

I feel very great hesitation about launching new species of the genus *Diplodon*, but there are several forms from Southern Brazil and adjacent regions that I cannot refer to any known species and the above is one of them. It has no striking characters, but is a simple, elongated, scarcely inflated form, often slightly truncated anteriorly. Some specimens show feeble, radial sculpture on the center of the disk, and it sometimes becomes plicate. Other shells are entirely destitute of such sculpture.

DIPLODON MIMUS n. s.

Shell small, long rhomboid, convex, solid, inequilateral, the beaks much eroded in the specimens seen; posterior ridge low, widely and decidedly double, ending behind in a wide biangulation at the base line; dorsal and ventral lines nearly parallel; surface very finely, concentrically sculptured; epidermis brown, tawny on the center of the disk, scarcely shining; left valve with two pseudocardinals, the posterior small, and two remote laterals; right valve with two pseudocardinals, the lower strong, and one lateral; muscle scars well impressed; beak cavities shallow, with a few pits; nacre dull whitish, lurid purple within, thicker in front.

Length 37, height 28, diam. 17 mm.

Iguape, Brazil.

A small solid, rhomboid species, which almost exactly mimics in external appearance some of the varieties of *Unio complanatus*. The dirty nacre is finely, radially sculptured outside the pallial line in some specimens.

DIPLODON TRIVIALIS n. s.

Shell elliptical or obovate, convex, subsolid, inequilateral, nearly evenly rounded before and behind; beaks moderately full, raised somewhat above the dorsal line, which is incurved in front of them, their sculpture numerous, fine, radial bars; posterior ridge scarcely developed; surface unevenly, rather finely sulcate; epidermis black or dark brown, somewhat cloth-like when fresh, subshining and tinted green when rubbed; left valve with two compressed pseudocardinals, the anterior one sometimes feeble, and two remote, delicate laterals; right valve with two compressed pseudocardinals, the upper small, and one lateral; dorsal pits few, under the hinge and parallel with it; muscle scars shallow; nacre bluish-white, often blotched.

Length 52, height 33, diam. 20 mm.

Taboticabal, San Paulo, Brazil.

This species is a little wider behind than in front and is nearly evenly rounded at both ends. A number of specimens were sent by von Ihering from the type locality.

Group of *Diplodon granosus*.

Shell elliptical to subtrapezoidal, somewhat compressed, rather thin, beaks low, the sculpture irregularly radial, the ridges narrow and sharp, separated by wide, trough-like spaces, the outer in particular often becoming somewhat nodulous or corrugated, the inner approaching and united below; surface sometimes slightly concentrically ridged and granose; teeth delicate, compressed; nacre bluish.

Animal unknown.

DIPLODON GRANOSUS (Bruguiere).

Shell long elliptical or subrhomboid, subcompressed to quite convex, subsolid, inequilateral; beaks neither high nor full, having irregular, radial, granular sculpture; posterior ridge low, sometimes rounded, often slightly angular or biangulate, ending behind in a blunt, rounded point below the median line; surface delicately, often unevenly, concentrically sculptured, generally more or less granose; sometimes having wavy, zigzag or chevron-shaped granular bars; occasionally it is nearly smooth and shows traces of radial sculpture; teeth delicate, compressed; each valve with two pseudocardinals, the posterior one in the left often nearly wanting; two laterals in the left valve and one in the right; nacre whitish, often lurid in the cavities, thicker in front.

Length 50, height 26, diam. 15 mm.
Length 58, height 35, diam. 19 mm.
Length 58, height 28, diam. 18 mm.
Length 39, height 21, diam. 14 mm.
Brazil: Guiana.

Unio granosa BRUGIERE, Jl. de Hist. Nat., I, 1792, p. 107, pl. VI, figs. 3, 4.—DESHAYES, Enc. Meth., II, 1827, p. 151, pl. CCXLIX, fig. 2.

Unio granosus HANLEY, Biv. Shells, 1843, p. 182, pl. XXIII, fig. 21.

Margarita (Unio) granosus LEA, Syn., 1836, p. 17; 1838, p. 16.

Margaron (Unio) granosus LEA, Syn., 1852, p. 23; 1870, p. 34.

Diplodon granosus SIMPSON, Syn., 1900, p. 878.

Unio multistriatus LEA, Tr. Am. Phil. Soc., IV, 1831, p. 91, pl. XII, fig. 22; Obs., I, 1834, p. 101, pl. XII, fig. 22.—HANLEY, Biv. Shells, 1843, p. 176, pl. XX, fig. 35.—CHENU, Ill. Conch., 1858, pl. XI, figs. 2, 2*a*, 2*b*.—SOWERBY, Conch. Icon., XVI, 1868, pl. LXXXV, fig. 455.

Margarita (Unio) multistriatus LEA, Syn., 1836, p. 13; 1838, p. 14.

Unio multistriata d'ORBIGNY, Voy. Am. Mer., 1843, p. 607.

Unio pfeifferi DUNKER, Zeits. für Mal., V, 1848, p. 181.—PFEIFFER, Nov. Conch., II, 1866, p. 151, pl. XXXIX, figs. 4-9.

Unio psammactinus PHILIPPI, Conch., III, 1848, p. 79, pl. V, fig. 2.—KUSTER, Conch. Cab. Unio, 1856, p. 159, pl. XLV, fig. 6.

Unio famelicus GOULD, Pr. Bost. Soc. N. H., III, 1850, p. 294; U. S. Expl. Exp., XII, 1852, p. 432, figs. 544*a*, 544*b*.—SOWERBY, Conch. Icon., XVI, 1868, pl. LXXV, fig. 391.

Margaron (Unio) famelicus LEA, Syn., 1852, p. 34; 1870, p. 54.

Unio niloticus SOWERBY, Conch. Icon., XVI, 1868, pl. LXXIII, fig. 374.

An exceedingly variable species and one which seems to be quite abundant. Bruguiere's figure in the Encyclopedie Methodique fairly well represents a phase of this protean shell. I feel quite sure that Dunker's *Unio pfeifferi* is merely a form of this with rather strong, chevron-shaped sculpture, and it is quite probable that *granuliferus* and *rufofuscus* are only varieties of it. Usually, though not always, the more strongly sculptured specimens have a dull brownish epidermis, while the smoother forms are more glossy and sometimes green-tinted. I think there can be no doubt that Lea's *multistriatus* is the equivalent of *granosus*, but I do not believe that this equals Wagner's *Unio ellipticus*. The entire group, of which this is typical, is very puzzling.

DIPLODON SEMIGRANOSUS n. s.

Shell rather small, irregularly long elliptical or long ovate, subcompressed or convex, inequilateral, with a low rounded posterior ridge, above which is a wide, shallow, radial sulcus; beaks slightly elevated above the dorsal line, not swollen, sculptured with 18 or 20 slightly curved, broken or subnodulous ridges; surface with feeble, concentric sculpture, which is crossed by exceedingly faint, radial liræ and in addition is often subgranulous; epidermis olive or yellow-green, sometimes nearly black in old shells, dull or subshining; left valve with one small, subcompressed pseudocardinal, a vestige of a second behind it, and two remote laterals, the upper small; right valve with two compressed pseudocardinals and one lateral; nacre dirty bluish-white, somewhat thickened in front.

San Paulo River; Ponte Grande; Os Perus, Brazil.

A large number of specimens of a little *Diplodon* were sent by Dr. von Ihering to the National Museum from several localities, which I at first referred to *D. granosus* with much doubt. It is solider and less high than that species; it is more elliptical or ovate, sometimes being drawn out somewhat behind; it is greener-colored and not so granose as that species often is.

DIPLODON GRANULIFERUS (Dunker).

Shell subelliptical, small, subcompressed, inequilateral, subsolid; beaks low, their sculpture not described; posterior ridge low and rounded, ending behind in a blunt, rounded point near the base line, surface sculptured with fine, granulous, curved, wavy, subradial ridges; epidermis olivaceous; pseudocardinals delicate; laterals lamellar and curved; nacre iridescent.

Length 34, height 22, diam. 12 mm.

Province of Rio de Janeiro, Brazil.

Unio granuliferus DUNKER, Zeits. für Mal., V, 1848, p. 182.—PFEIFFER, Nov. Conch., II, 1866, p. 150, pl. XXXIX, figs. 1-3.

Diplodon granuliferus SIMPSON, Syn., 1900, p. 879.

Unio granulifer PÆTEL, Conch. Sam., III, 1890, p. 154.

I have never seen this species, which may be merely a form of *D. granosus*. The curved rows of nodules are slightly divaricate along the posterior ridge. It is more nearly elliptical than any specimens of *granosus* that I have seen.

DIPLODON EFFULGENS (Lea).

Shell subtrapezoidal, rather small, subsolid, subcompressed, inequilateral, with apparently low beaks, their sculpture not observed; anterior end narrowed and rounded; post-dorsal region elevated almost into a wing; post-dorsal slope subtruncate; posterior ridge low and rounded, ending behind in a rounded point near the base line; surface sculptured with fine, concentric ridges and showing vestiges of granulation and radial sculpture; epidermis greenish-brown, shining; left valve with one subcompressed, irregular pseudocardinal with some uneven denticles behind it and two small, remote laterals; right valve with two pseudocardinals, the upper much compressed, the lower prolonged backward and much split up, with one lateral: nacre lurid whitish, thicker in front.

Length 50, height 30, diam. 16 mm.

Brazil.

Unio effulgens LEA, Pr. Ac. N. Sci. Phila., VIII, 1856, p. 94; Jl. Ac. N. Sci. Phila., III, 1857, p. 303, pl. XXVIII, fig. 18; Obs., VI, 1857, p. 23, pl. XXVIII, fig. 18.

Margaron (Unio) effulgens Lea, Syn., 1870, p. 35.
Diplodon effulgens Simpson, Syn., 1900, p. 879.
Unio eurhynchus Kuster, Conch. Cab. Unio, 1861, p. 237, pl. lxxix, fig. 5.

Apparently close to *D. granosus,* but more trapezoidal and more solid. The peculiar pseudocardinals differ from those of that species. Lea states in the Observations that this shell is in the cabinet of Dr. Budd, but does not claim to have it in his own. The type, from Dr. Budd, is now in his collection.

Diplodon rufofuscus (Lea).

Shell short rhomboid, convex, rather solid, inequilateral, with low, scarcely inflated beaks; post-dorsal part high, subangulate where it meets the truncation of the posterior slope; posterior ridge full but widely rounded, ending in a rounded point at the base line; surface sculptured with concentric ridges; the umbonal region is marked with subnodulous, fine, chevron-shaped bars, this pattern fading out on the body of the shell, though over its whole surface there are traces of nodules and radiating lines; epidermis rich dark chestnut, lighter in the umbonal region, subshining; left valve with two low, subcompressed pseudocardinals and two curved laterals; right valve with a high, subcompressed pseudocardinal, a small one above it, and one lateral; muscle scars small; nacre dirty bluish-white, thickened in front.

South America.

Unio rufofuscus Lea, Pr. Ac. N. Sci. Phila., IX, 1865, p. 76; Jl. Ac. N. Sci. Phila., VI, 1868, p. 282, pl. xxxix, fig. 96; Obs., XII, 1869, p. 42, pl. xxxix, fig. 96.
Margaron (Unio) rufofuscus Lea, Syn., 1870, p. 31.
Diplodon rufofuscus Simpson, Syn., 1900, p. 880.

This has much the appearance of a very short, solid *D. granosus,* near which species it was placed in the Synopsis. The type is in the Lea Collection, probably donated by Signor Paz. after the twelfth volume of the Observations was published. Perhaps a member of the *lacteolus* group. There are a number of species, which possess characters of both groups and might almost as well be placed in one as the other.

DIPLODON DEMERARAENSIS (Lea).

Shell rhomboid oblong, inequilateral, convex, rather solid; beaks moderately full, sculptured with radial bars; surface strongly concentrically sulcate; epidermis olive-brown, rayless; pseudocardinals subcompressed striate, erect, double in both valves; laterals somewhat curved; nacre white and iridescent.

Length 38, height 23, diam. 13 mm.

Demerara.

Unio demararaensis LEA, Pr. Ac. N. Sci. Phila., XI, 1859, p. 152.

Unio demeraraensis LEA, Jl. Ac. N. Sci. Phila., IV, 1860, p. 253, pl. XXXIX, fig. 133; Obs., VII, 1860, p. 71, pl. XXXIX, fig. 133.—REEVE, Conch. Icon., XVI, 1865, pl. XXII, fig. 99.

Margaron (Unio) demeraraensis LEA, Syn., 1870, p. 36.

Diplodon demararaensis SIMPSON, Syn., 1900, p. 880.

Unio demarasensis PÆTEL, Conch. Sam., III, 1890, p. 150.

I have never seen this shell; the type, which is the only specimen known, being in the Cumingian collection. Were it not that Dr. Lea distinctly states that it has radial beak sculpture of the South American type, I should be sure that it was a young *Unio dysoni,* which species is figured beside it in the Observations. The form, the slight biangulation behind, the strong sulcation and the character of the teeth would seem to place it with or close to *Nephronaias dysoni.* I am not at all sure that it should not be made the type of a separate group. By an error this was written *demararaensis* in the Synopsis.

DIPLODON LEPIDIOR (Lea).

Shell oblong, somewhat rhomboid, scarcely subsolid, convex, inequilateral; beaks not very full, rising a little above the dorsal line, their sculpture a number of rather strong, straight, radial ridges, the middle ones converging a little below; posterior ridge low, rounded, with a feeble radial rib above it; surface with close, fine growth lines; epidermis yellowish-green, the hinder half of the shell darker and there is sometimes a broad, dark, concentric, central band, the whole smooth and shining; the two pseudocardinals of the left valve are compressed, the posterior one feeble, the two laterals are delicate and lamellar; right valve with two compressed pseudocardinals, the upper small, and one lateral; nacre bluish-white, a little thicker in front.

Length 52, height 29, diam. 17 mm.

Uruguay River.

Unio lepidus Lea, Pr. Ac. N. Sci. Phila., IV, 1860, p. 91; Jl. Ac. N. Sci. Phila., V, 1863, p. 390, pl. L, fig. 306; Obs., X, 1863, p. 25, pl. L, fig. 306.

Margaron (Unio) lepidior Lea, Syn., 1870, p. 53.

Diplodon lepidior Simpson, Syn., 1900, p. 880.

The dorsal and ventral lines are nearly parallel, the anterior end being a trifle narrowed. The surface is smooth and shining, of much the same texture and appearance as many of the forms of this group west of the Andes. First called *lepidus* by Lea, but changed by him to *lepidior* because *lepidus* had been used by Gould for a *Unio*.

Diplodon parcus (Lea).

Shell long and nearly evenly elliptical, convex, inequilateral, with moderately full beaks, which are elevated a little above the dorsal line, their sculpture about sixteen, rather strong, straight ridges; posterior ridge moderate, rounded; growth lines irregular; epidermis smooth, shining, yellow green, slightly bronzy, with a light median, concentric band; left valve with one compressed pseudocardinal with a vestige of another behind it and two delicate laterals; right valve with two pseudocardinals, the upper very small, and one straight lateral; beak cavities shallow; nacre pale blue.

Length 37, height 18, diam. 14 mm.

South America.

Unio parcus Lea, Pr. Ac. N. Sci. Phila., X, 1866, p. 34; Jl. Ac. N. Sci. Phila., VI, 1868, p. 262, pl. XXXIII, fig. 77; Obs., XII, 1869, p. 22, pl. XXXIII, fig. 77.

Margaron (Unio) parcus Lea, Syn., 1870, p. 47.

Diplodon parcus Simpson, Syn., 1900, p. 880.

Probably a young shell. It is more inflated than most members of this group, but it has the smooth, bronzy epidermis of many of its members.

Diplodon chilensis (Gray).

Shell long elliptical, subrhomboid or slightly obovate, scarcely subsolid, subcompressed, inequilateral; beaks neither full nor elevated, sculptured with delicate, narrow, radial ridges; posterior ridge almost wanting, ending behind in a wide, rounded point below the median line; surface with delicate, concentric sculpture; epidermis greenish or greenish-olive, shining; teeth delicate, compressed; left valve with one pseudocardinal and two laterals; right valve with two pseudocardinals and one lateral; nacre bluish or purplish, generally bright and iridescent.

Length 66, height 33, diam. 19 mm.

Length 57, height 32, diam. 16 mm.

Island of Chiloe, Chile.

Unio chilensis Gray, Spic. Zool., 1828, pl. vi, fig. 12.—Philippi, Conch., III, 1847, p. 9, pl. iv, fig. 2.—Kuster, Conch. Cab. Unio, 1862, p. 282, pl. xcv, fig. 12.—Sowerby, Conch. Icon., XVI, 1867, pl. lvi, fig. 286.

Diplodon chilensis Simpson, Syn., 1900, p. 880.

Unio smithii Gray and Pidgeon, Griff. Cuv., XII, 1834, p. 600, pl. xx, fig. 3.—Hanley, Biv. Shells, 1843, p. 195, pl. xxiii, fig. 58.

Margarita (Unio) smithii Lea, Syn., 1836, p. 27; 1838, p. 20.

Margaron (Unio) smithii Lea, Syn., 1852, p. 30; 1870, p. 48.

Unio auratus Philippi, Conch., III, 1847, p. 9, pl. iv, fig. 1.

Margarita (Unio) auratus Lea, Syn., 1836, p. 31; 1838, p. 22.

Margaron (Unio) auratus Lea, Syn., 1852, p. 33; 1870, p. 53.

Unio araucanus Philippi, Conch., III, 1847, p. 50, pl. iv, fig. 3.—Kuster, Conch. Cab. Unio, 1862, p. 283, pl. xcv, fig. 3.

Margaron (Unio) araucanus Lea, Syn., 1870, p. 53.

Unio araucana Hupé, Gay's Hist. Chile, 1854, p. 317.

Unio casæblancæ Philippi, Zeitz. für Mal., V, 1848, p. 176.

Unio casablancæ Pfeiffer, Nov. Conch., III, 1869, p. 481, pl. civ, figs. 1, 2.

Margaron (Unio) casablancæ Lea, Syn., 1870, p. 53.

Diplodon casæblancæ Simpson, Syn., 1900, p. 882.

Unio fragilis Sowerby, Conch. Icon., XVI, 1856, pl. xxx, fig. 155.

Unio longus PHILIPPI, Mal. Bl., XVI, 1869, p. 44.—PFEIFFER, Nov. Conch., III, 1869, p. 477, pl. CIII, figs. 1, 2.
Unio cotcolchaguensis PHILIPPI, Mal. Bl., XVI, 1869, p. 47.—PFEIFFER, Nov. Conch., III, 1869, p. 484, pl. CIV, figs. 9, 10.
Unio foncki PHILIPPI, Mal. Bl., XV, 1869, p. 49.—PFEIFFER, Nov. Conch., III, 1869, p. 483, pl. CIV, figs. 5, 6.
Unio funcki PÆTEL, Conch. Sam., III, 1890, p. 153.
Diplodon cuprinus SIMPSON, Syn., 1900, p. 883.

An abundant and variable form. In the Synopsis, I united four of Philippi's species under the name *casæblancæ* and am now of the opinion that all of them should be referred to this species. In a general way the shell is oblong, sometimes wider behind than in front · the posterior end may be nearly rounded or somewhat pointed below the median line; it is rather thin and subcompressed, the epidermis is bright and nearly smooth; the teeth are almost lamellar. There are shells in the National Museum collection from Brazil, which I can hardly separate from this species.

In the Synopsis I changed Sowerby's *Unio fragilis* to *cuprinus* because the former name had been used for a *Unio*. Since the issue of the Synopsis I have become convinced that his *fragilis* should also go in the synonymy of *D. chilensis*.

DIPLODON SOLIDULUS (Philippi).

Shell subelliptical, the dorsal line a little more rounded than the basal line, subinflated, rather solid, inequilateral, with moderately full, high beaks, whose sculpture is radial; posterior ridge low, rounded, ending behind in a rounded point below the median line; dorsal line incurved in front of the beaks; epidermis lightly, concentrically striated, brownish green; pseudocardinals solid, subcompressed; laterals curved; nacre bluish-white, tinted purple.

Length 54, height 33, diam. 20 mm.

Near Santiago; Chile.

Unio solidulus PHILIPPI, Mal. Bl., XVI, 1869, p. 46.—PFEIFFER, Nov. Conch., III, 1869, p. 480, pl. CIII, figs. 9, 10.
Diplodon solidulus SIMPSON, Syn., 1900, p. 881.

A rather short, inflated, solid species, but from the figure I should say it was a member of the *granosus* group. I have never seen the shell.

DIPLODON GASSIESI (Kuster).

Shell subrhomboid, subsolid, a little narrower in front, compressed or subcompressed, inequilateral; beaks probably low but so eroded in the specimens seen that their characters can not be made out; posterior ridge scarcely developed, widely rounded; dorsal line curved, ending behind in a rounded point at the base; base line straight or a little curved; surface with fine, irregular growth lines; epidermis dark, olive or bronzy-green, a little darker on the posterior slope; left valve with two pseudocardinals, the anterior higher and subcompressed, the posterior low and imperfect, with two delicate, curved laterals, the upper the smaller; right valve with two compressed pseudocardinals, the upper small, and one lateral; anterior scars impressed; posterior scars superficial; nacre bluish-white, darker and blotched in the cavities, considerably thicker in front.

Length 52, height 28, diam. 15 mm.

Chile.

Unio gassiesi KUSTER, (part), Conch. Cab. Unio, 1856, p. 148, pl. XLIII, fig. 4.

Diplodon gassiesi SIMPSON, Syn., 1900, p. 881.

? *Unio auratus* REEVE, Conch. Icon., XVI, 1865, pl. XXIX, fig. 150.

The younger shells of this species are slightly rounded on the basal line; the old shells become developed at the posterior end, which grows downward until the base line is straight. The nacre is thickened in front and lurid in the cavities; the posterior pseudocardinal of the left valve is low and feebly developed.

DIPLODON APLATUS (Reeve).

Shell oblong, subrhomboid, convex, subsolid, inequilateral; dorsal line irregularly curved, ending behind at the base in a wide subtruncation or broad rounded point; posterior ridge moderate, rounded or faintly double; beaks raised a little above the dorsal line, moderately full, sculptured with a few, widely spaced, narrow, short, radial bars, the central pair coalescing; surface with fine, concentric sculpture, becoming much stronger on the later growth; epidermis bronzy-olive in front, rich bronzy-brown behind; left valve with a sort of double, compressed, rough pseudocardinal and two curved laterals; right valve with two compressed pseudocardinals, the upper small, and one lateral; muscle scars impressed; nacre bluish-white, lurid purplish in the cavities, slightly thicker in front.

Length 67, height 34, diam. 21 mm.

Island of Chiloe, Chile.

Unio aplatus REEVE, Conch. Icon., XVI, 1865, pl. XXVIII, fig. 143.

Diplodon aplatus SIMPSON, Syn., 1900, p. 881.

A little larger, more inflated, and more bronzy than *D. gassiezi*. Lea has a shell from Cuming, which agrees very closely with Reeve's figure of *aplatus*. The nacre is not quite so much thickened in front as is that of *gassiesi*.

DIPLODON MOLINÆ (Philippi).

Shell long rhomboid, the dorsal and ventral lines parallel; subcompressed, inequilateral, subsolid; beaks low with short, radial bars; epidermis pale yellowish-brown or greenish-brown on the front half of the shell, rather suddenly becoming dark green on the posterior half; there are sometimes a few, scattered rays on the anterior part; teeth compressed; nacre bluish-white.

Length 67, height 40, diam. 21 mm.

Southern Chile.

Unio molinæ PHILIPPI, Conch., III, 1847, p. 50, pl. IV, fig. 4.—KUSTER, Conch. Cab. Unio, 1862, p. 281, pl. XCV, fig. 1.

Diplodon molinæ SIMPSON, Syn., 1900, p. 881.

Unio auratus SOWERBY, Conch. Icon., XVI, 1866, pl. XLV, fig. 245.

The almost exactly rhomboid form and the peculiar pattern of color would seem to be pretty good characters by which this might be distinguished from nearly allied forms. Sowerby's *Unio auratus* seems to be a young shell of the same thing. Its beaks are perfect and therefore a little higher than those of the specimens figured by Philippi, which are eroded, and Sowerby's shell shows more scattered rays.

DIPLODON MODESTUS (Kuster).

Shell oblong, subtrapezoid, subinflated, subsolid, inequilateral; beaks low, their sculpture not seen; surface apparently strongly, concentrically striate; posterior ridge rounded, ending behind in a blunt point on the nearly straight base line; epidermis fuscous, shining; pseudocardinals subsolid; laterals short; nacre bluish-white.

Length 58, height 32, diam. 20 mm.

Chile.

Unio modestus KUSTER, Conch. Cab. Unio, 1856, p. 147, pl. XLIII, fig. 2.

Diplodon modestus SIMPSON, Syn., 1900, p. 881.

Unio ianthinus PHILIPPI, Mal. Bl., XVII, 1869, p. 47.—PFEIFFER, Nov. Conch., III, 1869, p. 485, pl. CIV, figs. 11, 12.

Unio valdivanus PHILIPPI, Mal. Bl., XVI, 1869, p. 48.—PFEIFFER, Nov. Conch., III, 1869, p. 479, pl. CIII, figs. 7, 8.

Unio montanus PHILIPPI, Mal. Bl., XVI, 1869, p. 48.—PFEIFFER, Nov. Conch., III, 1869, p. 482, pl. CIV, figs. 3, 4.

Credited to Charpentier manuscript by Kuster.

At the time of writing the Synopsis I was inclined to believe that this species equaled some of Philippi's Chilean species, but more careful study of the figures and descriptions lead me to believe it is different. It seems to be rather more solid and inflated like the forms, which were placed by Philippi under *D. ianthinus*. A dorsal view of Charpentier's species shows that both ends are suddenly narrowed into blunt points.

DIPLODON ATRATUS (Sowerby).

Shell rather short, obovate, subrhomboid, subcompressed, scarcely subsolid, inequilateral, with slightly raised beaks having delicate, radial sculpture; posterior ridge low, rounded, ending in a rounded point behind near the base, the posterior end above it obliquely subtruncated; surface apparently finely, concentrically sculptured; epidermis brownish-green; teeth compressed; nacre bluish-white.

Length 48, height 26, diam. 15 mm.

Length 50, height 30, diam. 17 mm.

Peru; Chile.

Unio atratus SOWERBY, Conch. Man., 1839, fig. 148.

Diplodon atratus SIMPSON, Syn., 1900, p. 881.

Unio limensis KUSTER, Conch. Cab. Unio, 1856, p. 146, pl XLII, fig. 7; XLIII, fig. 1.

Unio jacobæus PHILIPPI, Mal. Bl., XVI, 1869, p. 44.—PFEIFFER, Nov. Conch., III, 1869, p. 478, pl. CIII, figs. 3, 4.

Unio landbecki PHILIPPI, Mal. Bl., XVI, 1869, p. 45.—PFEIFFER, Nov. Conch., III, 1869, p. 479, pl. CIII, figs. 5, 6.

Unio diplodon PHILIPPI, Mal. Bl., XVI, 1869, p. 46.—PFEIFFER, Nov. Conch., III, 1869, p. 483, pl. CIV, 7, 8.

I have united under the oldest name several of Philippi's so-called species whose differences are so trifling that they do not seem to me to be worthy of varietal rank. Philippi bestowed names on every conceivable variation among the Uniones of Chile and it seems to me to be quite likely that a large series of specimens from that region would show that a farther reduction of names was necessary. Those which I have thrown together under the name *atratus* are rather short and obovate or subrhomboid in outline. Their author does not say whether they are sculptured or not or anything regarding the degree of smoothness of the surface. *Unio diplodon* Philippi may belong here.

DIPLODON OBTUSUS (d'Orbigny).

"Shell ovate, compressed, rather thick, concentrically rugose; epidermis greenish-brown, umbones smooth, ends obtuse, rounded, posterior end elongate; nacre bluish-green.

Length 66 mm. In proportion to the length, the height is 55-100, the diameter 34-100, length of the posterior margin 77-100; apical angle 157°." (d'Orbigny).

La Laguna, Province of Valparaiso, Chile.

Unio obtusa d'ORBIGNY, Guer. Mag., 1835, p. 35; Voy. Am. Mer., 1843, p. 610.

Diplodon obtusus SIMPSON, Syn., 1900, p. 882.

"This species is close to *U. patagonica,* but is distinguished by its much larger size, more obtuse extremities and by its more rugose surface."

Said by d'Orbigny to be of Ferussac, but he does not say where that author described it and I do not know where. If the species be a valid one, it will probably have to have a new name. d'Orbigny did not describe it until 1843. In 1835 he quotes it as "*obtusa* Fer.," but gives no description and refers it to *depressa* Less., (1830), from New South Wales. The *obtusa* (Fer.) d'Orbigny of 1835 would fairly seem to be a synonym of *depressa* and the name could not be used again for the Chilean species when finally described in 1843. Until the status of the species is definitely determined, it hardly seems worth while to rename it.

DIPLODON RHUACONICUS (Kuster).

Shell subrhomboid, a little wider behind, convex, inequilateral with only moderately full beaks, whose sculpture consists of strong, radial bars extending well onto the disk; posterior ridge somewhat double, ending behind in a feeble biangulation just below the median line; surface densely, concentrically striate and sulcate; epidermis very dark, showing the growth lines; pseudocardinals compressed, the posterior one in the left valve imperfect; nacre bluish-white.

Length 53, height 30, diam. 16 mm.

Uruguay.

Brazil.

Unio rhuaconicus KUSTER, Conch. Cab. Unio, 1856, p. 145, pl. XLII, fig. 5.

Diplodon rhuaconicus SIMPSON, Syn., 1900, p. 882.

This is very different from d'Orbigny's *rhuacoica.*

Kuster states that this is *Unio rhuaconicus* Pfeiffer teste Charpentier. I know nothing of it beyond the figure and description in the Conchylien Cabinet. It is almost jet black, but the rest lines are exhibited in the figure. It seems to be remarkable for its very strong, even sculpture, which extends out well on to the disk.

DIPLODON CHILOENSIS (Kuster).

Shell long elliptical, moderately convex, inequilateral, smooth; anterior end narrowly rounded; posterior part ending in a rounded point just below the median line, and at the ending of the low, rounded posterior ridge; beaks scarcely elevated, their sculpture unknown; surface smooth, pitch black.

Length 66, height 37 mm.

Island of Chiloe, Chile.

Unio chiloënsis KUSTER, Conch. Cab., 1856, p. 161, pl. XXXV, fig. 6.

Diplodon chiloënsis SIMPSON, Syn., 1900, p. 882.

Kuster gives no account of the teeth, nacre or degree of solidity of his species. It is rather evenly elliptical in outline and this character and the jet black epidermis ought to distinguish it from nearly allied forms. Kuster gives a figure of *Unio chiloënsis,* which he credits to Philippi in sched. under this name. He also credits the species to Philippi in the Abbildungen under the name *Unio auratus*.

DIPLODON FRENZELLII (von Ihering).

Shell oblong, subcompressed or convex, quite solid, inequilateral, with the dorsal and ventral lines nearly parallel; anterior and posterior ridge nearly or quite wanting; beaks low, not inflated, their sculpture consisting of fifteen or sixteen nearly straight, radial ridges, the middle ones converging, the spaces between them strongly, concentrically striate; surface covered with coarse, uneven, concentric ridges; epidermis pale tawny or yellowish-green, shining, somewhat bronzy; left valve with two small pseudocardinals, the anterior compressed, the posterior imperfect, and two remote laterals; right valve with two pseudocardinals, the lower larger, and one remote lateral; beak cavities shallow with two or three deep dorsal scars in each; nacre dirty white, lurid in the cavities, thickened and solid in front.

Length 71, height 35, diam. 20 mm.

Length of a younger shell 50, height 26, diam. 12 mm.

Patagonia; Chile; Os Perus, San Paulo, Brazil.

Unio frenzellii VON IHERING, Arch. für Nat., 1893, p. 3, pl. IV, fig. 12.

Diplodon frenzellii SIMPSON, Syn., 1900, p. 882.

Dr. von Ihering sent two shells to the National Museum which are probably this species. The form is oblong and almost evenly rounded at the ends, there is no posterior ridge, but one or two feeble raised lines on the posterior slope. The shell is quite solid and strongly sulcate, of a peculiar yellowish-green with a bronzy or metallic tint. Von Ihering states that it is sometimes brown.

DIPLODON HUAPENSIS Bartsch.

"Shell thin, elongate, elliptical, drawn out posterio-ventrally into a blunt beak, compressed dorsally, from a line extending from the umbones to the posterior-dorsal margin of the beak and somewhat pinched in its subcentral ventral half. Dorsal margin slightly curved, its posterior third sloping regularly obliquely downward. Anterior margin abruptly curved, falling off a little more gradually toward the ventral than the dorsal edge. Posterior extremity evenly rounded. Ventral margin somewhat concave in the middle. Periostracum brown on the posterior dorsal portion of the shell, grading to wax-yellow streaked with brown on the anterior ventral parts. Surface marked with numerous lines of growth, the stronger ones of which are usually darker colored than the general surface, and numerous fine, crinkly, radiating lines, which are best developed on the anterior half, and gradually diminished in prominence posteriorly. Beak cavities shallow. Pseudocardinals in the right valve two, narrow, weak, sublamellar, and very oblique, the dorsal one decidedly notched and stronger than the ventral, which is rugose. Left pseudocardinal narrow, slender, slight, notched, and cut into many fine tubercles.

Right lateral only moderately curved, very slender, slightly roughened, more so on the inner than on the outer edge. Left laterals thin, and lamellar, inner one larger and better developed than the dorsal, both with roughened edges. Nacre bluish, with many spots of livid olive, which are more numerous and extensive in the dorsal part of the shell than ventrally. Posterior part iridescent.

Length 55, height 25.9, diam. 14.5 mm." (Bartsch).

Type locality, Victoria Island, Lake Nahuel Huape, Argentina.

Diplodon huapensis Bartsch, Pr. U. S. Nat. Mus., XXX, 1906, p. 394, pl. xxvii-xxix.

"The shell in a general way recalls *Diplodon casæblancæ* Philippi and *Diplodon frenzellii* Ihering, but can readily be distinguished from them by its narrower outline."

Diplodon martensi (von Ihering).

Shell long rhomboid, a little wider behind, subinflated, subsolid, quite inequilateral, with low beaks whose sculpture is not shown in the figure; posterior ridge low, rounded, ending behind in a rounded point at the base of an oblique posterior truncation and near the basal line; base line a little incurved in the middle, full behind the emargination; surface smooth, greenish-chestnut; pseudocardinals sublamellar; laterals remote; nacre silvery, iridescent.

Length 59, height 29, diam. 21 mm.

Southern Brazil.

Unio martensi von Ihering, Arch. für Nat., 1893, p. 100, pl. iv, fig. 10.

Diplodon martensi Simpson, Syn., 1900, p. 882.

Diplodon dunkerianus (Lea).

Shell oblong, irregularly elliptical, a little wider behind, inequilateral, scarcely subsolid; beaks rather low, not inflated, their sculpture rather strong, sometimes corrugated, radial bars, the posterior ones extending well over the disk; posterior ridge well developed, somewhat biangulate, there being one or two faint, radial ridges above it; posterior slope subtruncate; base angularly inflated near the hinder end of the shell, the posterior point of which is faintly biangulate and on the median line; surface with delicate, close, raised growth lines; epidermis nearly black, lighter at the umbonal region; left valve with one lamellar pseudocardinal with sometimes a blurred vestige of a posterior one, and two delicate laterals; right valve with two long pseudocardinals and one lateral; beak cavities shallow; nacre bluish, silvery.

Length 57, height 29, diam. 17 mm.

Rio Macacon, Rio Janiero, Brazil; New Granada.

Unio dunkerianus Lea, Pr. Ac. N. Sci. Phila., VIII, 1856, p. 94; Obs., VI, 1857, p. 25, pl. xxviii, fig. 20; Jl. Ac. N. Sci. Phila., III, 1858, p. 303, pl. xxviii, fig. 20.—Kuster, Conch. Cab. Unio, 1862, p. 290, pl. xcii, fig. 6.—Sowerby, Conch. Icon., XVI, 1868, pl. xc, fig. 485.

Margaron (Unio) dunkerianus Lea, Syn., 1870, p. 32.

Diplodon atratus (part), Simpson, Syn., 1900, p. 882.

Lea has two specimens in his collection, one from Dr. Dunker, said to some from Rio Janiero, and the other, which he has figured, from New Granada, presented by Verreaux. They are undoubtedly identical and seem to have as distinguishing characters the angular post-basal swelling, the glossy black epidermis, which is lighter above, and the lengthened posterior beak sculpture.

Diplodon binneyi (Lea).

Shell long elliptical, pointed on the median line behind, with the posterior base somewhat angularly swollen and the posterior slope subtruncated, subcompressed, thin; posterior ridge low, sub-biangulate; beaks low and somewhat compressed, eroded in the only specimen seen, but showing distinct, radial sculpture extending some distance out on to the disk; surface irregularly, concentrically sculptured; epidermis olive or bronzy-green, scarcely shining; left valve with an anterior compressed pseudocardinal, the hinder one a mere low tubercle and two delicate laterals; right valve with two compressed pseudocardinals, the upper small, and one lateral; nacre bluish-white.

Length 55, height 29, diam. 15 mm.

South America.

Unio binneyi LEA, Pr. Am. Phil. Soc., IV, 1845, p. 165; Tr. Am. Phil. Soc., X, 1848, p. 77, pl. VI, fig. 18; Obs., IV, 1848, p. 51, pl. VI, fig. 18.

Margaron (Unio) binneyi LEA, Syn., 1852, p. 29; 1870, p. 46.

Diplodon binneyi SIMPSON, Syn., 1900, p. 878.

Dr. Lea received this shell from Dr. Griffith and it is labeled "Alabama" with a question, though he credits it to the Southern States in his description. The type, the only shell I have seen, though eroded at the beaks shows radial sculpture plainly, some of this extending on to the healthy epidermis. It is thinner than *dunkerianus,* is much more strongly sulcate, is lighter colored and not so shining, and has shorter pseudocardinals. It probably groups with it.

DIPLODON AUREUS Simpson.

Shell oblong, irregularly elliptical, subsolid, convex, inequilateral; dorsal outline more strongly curved than that of the base; beaks moderately full, their sculpture radial; posterior ridge low and rounded, ending behind in a bluntly rounded point a little above the base; surface strongly, concentrically sculptured; bronzy, olivaceous-yellow, shining; pseudocardinals small, crenated; those of the left valve united; there are two compressed ones in the right valve, the upper smaller; left valve with two remote laterals; right valve with one; muscle scars impressed; nacre bluish-white, stained dull purple in the cavities.

Length 60, height 30, diam. 20 mm.

Length 68, height 34, diam. 22 mm.

Chile.

Unio auratus KUSTER, Conch. Cab. Unio, 1856, p. 161, pl. XLVI, fig. 3.

Diplodon aureus SIMPSON, Syn., 1900, p. 883.

A fine species, of which the Lea Collection contains a good specimen. The radial sculpture occupies but a small area, the surface is strongly, concentrically sculptured, and the epidermis is shining, and is a rich bronzy, olivaceous-yellow. Kuster supposes this to be the *Unio auratus* of Swainson and Philippi, which is quite a different thing. I therefore give it a new name.

DIPLODON CORIACEUS (Dunker).

Shell oval, subrhomboid, subcompressed, surface mostly coriaceous, granulose; epidermis olivaceous; anterior end short; posterior end produced; beaks small; nacre bluish-white, opaque.

Length 100, height 60, diam. 35 mm. ?

Rio Negro, Province of Rio Janeiro, Brazil.

Unio coriaceus DUNKER, Zeits. für Mal., V, 1848, p. 181.
Diplodon coriaceus SIMPSON, Syn., 1900, p. 883.

I know nothing whatever of this species save the description and a few remarks in Latin given by its author. Von Ihering mentions it in a list as from the Rio Negro in southern Brazil.

DIPLODON CHILDRENI (Gray).

Shell irregularly elliptical, being slightly curved on the dorsal line and much more strongly curved below, inequilateral, apparently little inflated and rather thin; beaks moderately full, eroded in the specimen figured; posterior ridge low, rounded, ending behind in a rounded point above the centre of the base; from this point upward the posterior end of the shell is somewhat truncated; surface showing the rest periods, dark reddish-brown; teeth compressed; nacre apparently bluish-white.

Length 74, height 47 mm.

South America.

Unio childreni GRAY, Griff. Cuv., XII, 1834, p. 600 (index), pl. XX, fig. 1.
Margarita (Unio) childreni LEA, Syn., 1836, p. 25; 1838, p. 19.
Margaron (Unio) childreni LEA, Syn., 1852, p. 28; 1870, p. 44.
Diplodon childreni SIMPSON, Syn., 1900, p. 883.

Griffith gives a figure of this shell and merely the name, *Unio childreni,* in the index and six words of description. The laterals are slender and nearly straight; the region of the pseudocardinals is badly eroded and these teeth are not clearly shown in the rather poor figure. The coloring shows the epidermis to be dark reddish-brown, and the nacre bluish-white. I know nothing of the species beyond what I have stated, but should place it in the *granosus* group of *Diplodon.* Griffith states that it is from South America and Lea says it is from Chile. It is higher in proportion than *D. chilensis,* and the ventral line is more inflated than in any other species I have placed in this group.

DIPLODON SANTA-MARIÆ n. s.

Shell olong, subrhomboid, wider behind, inequilateral, compressed, with a low, rounded posterior ridge; beaks low, with numerous, curved, radial ridges, which are sometimes granulous and slightly zigzagged, the central bars coalescing below; surface covered with fine, concentric sculpture; epidermis brown, sometimes olive-green and bronzy when young, scarcely shining, often cloth-like; left valve with a single, compressed pseudocardinal, the posterior one often almost or wholly wanting and two remote, nearly straight, laterals; right valve with two long lamellar pseudocardinals, the upper smaller, and one lateral; muscle scars well marked; nacre bluish-white, lurid in the cavities, a little thicker in front.

Length 63, height 33, diam. 18 mm.

Length 46, height 27, diam. 15 mm.

Brazil?

A peculiarly quadrate, compressed form with brown epidermis and fine, concentric sculpture. The posterior tooth in the left valve is wanting or nearly so in a large number of the shells I have seen.

Specimens under this name were received by the National Museum from von Ihering. I have not been able to discover that it has ever been published.

Group of *Diplodon burroughianus.*

Shell elliptical, moderately solid, inflated, sharply pointed behind, with a high, well-developed posterior ridge; beaks rather full; the sculpture consisting of regularly radiating, widely separated, sharp ridges, the intervening grooves rounded out; epidermis smooth, dark olive with lighter bands; pseudocardinals compressed, rough, vertically ridged, usually trifid or quadrifid in each valve; laterals curved, compressed; muscle scars smooth; nacre white, silvery.

Animal unknown.

DIPLODON BURROUGHIANUS (Lea).

Shell ovate, subinflated, rather solid, inequilateral, with full but not elevated beaks, whose sculpture consists of strong, uneven, radial ridges; posterior ridge well developed, angular, ending behind in a point on the median line; surface sculptured with irregular, strong, concentric ridges, and having traces of radial sculpture; epidermis ashy-green and dark brown in alternating, concentric bands; left valve with two compressed, roughened pseudocardinals, the posterior small, and two curved laterals; right valve with two pseudocardinals, the upper small, and one lateral; hinge line narrow and rounded between the two sets of teeth; muscle scars shallow; nacre silvery, iridescent behind.

Length 88, height 58, diam. 35 mm.

Length 71, height 43, diam. 26 mm.

Parana River, South America.

Unio burroughianus LEA, Tr. Am. Phil. Soc., V, 1834, p. 67, pl. x, fig. 27; Obs., I, 1834, p. 179, pl. x, fig. 27.—HANLEY, Biv. Shells, 1843, p. 197, pl. XXII, fig. 2.—SOWERBY, Conch. Icon., XVI, 1866, pl. XXXII, 169.

Margarita (Unio) burroughianus LEA, Syn., 1836, p. 29; 1838, p. 21.

Margaron (Unio) burroughianus LEA, Syn., 1852, p. 31; 1870, p. 50.

Diplodon burroughianus SIMPSON, Syn., 1900, p. 883.

Almost evenly elliptical in outline. There is sometimes a very slight post-dorsal wing and the base line is occasionally a little produced behind the middle. Old shells become quite dark and the banding fades out; in younger specimens the bands are quite distinct.

DIPLODON TRIFIDUS (Lea).

Shell long ovate, solid, scarcely inflated, very inequilateral, with high, rather full beaks, which are sculptured with numerous, strong, radial bars that extend well out on to the disk; posterior ridge strong and decidedly angled, ending behind in a point a little below the median line; surface with faint, concentric sculpture; epidermis smooth, almost shining, dark and light olive-green in concentric bands; left valve with two high, very ragged pseudocardinals with a feeble third one between them, the middle one split up, and two curved laterals; right valve with one strong, ragged pseudocardinal, a very small one above it, and a divided lateral; muscle scars small, impressed; dorsal scars distinct; nacre bluish-white, somewhat silvery.

Length 42, height 22, diam. 15 mm.

Argentina.

Unio trifidus LEA, Pr. Ac. N. Sci. Phila., IV, 1860, p. 89; Jl. Ac. N. Sci. Phila., V, 1863, p. 386, pl. XLIV, fig. 295; Obs., X, 1863, p. 22, pl. XLIV, fig. 295.

Margaron (Unio) trifidus LEA, Syn., 1870, p. 50.

Diplodon trifidus SIMPSON, Syn., 1900, p. 884.

The type, the only specimen I have seen, may be a young shell, though it is quite solid. This species is more solid and elongated than *D. burroughianus* and its pseudocardinals are much ruder and rougher.

DIPLODON IHERINGI (Clessin?).

Shell small, nearly evenly elliptical, inequilateral, subsolid, convex, with a well developed, subangular posterior ridge, which ends behind in a point at the median line; beaks moderately full, not much elevated above the dorsal line, with numerous subradial bars, which point downward and backward, anterior end subtruncate; surface finely, concentrically striate; epidermis brownish or brownish-green, banded, scarcely shining; left valve with two compressed pseudocardinals, the hinder one feeble, and two delicate, curved laterals; right valve with one compressed pseudocardinal and a vestige of another above it, with one lateral; muscle scars impressed; nacre bluish, tinted yellow in the cavities.

Length 28, height 20, diam. 13 mm.

Guahyba, Brazil.

Unio iheringi Simpson, Syn., 1900, p. 894.

This is a neat species, the smallest of the Diplodons and quite distinct from all others. It is less drawn out behind than either of the species placed in this group.

I have not been able to discover whether this species has ever been described or not.

Group of *Diplodon pazi*.

Shell subtrapezoidal, rounded in front and strongly biangulate behind; the wavy beak sculpture extending well over the disk; epidermis olive; pseudocardinals ragged, with a tendency to break into denticles.

Diplodon pazi (Hidalgo).

Shell unevenly ovate or subrhomboid, subsolid, convex, the dorsal line curved; post-dorsal slope subtruncated; posterior ridge double below, ending a little above the base in a slight biangulation: post-dorsal region a little produced; between this and the posterior point the base line is feebly incurved; beaks apparently not high, their sculpture consisting of strong, subnodulous, subradial ridges, the central ones coalescing; below these ridges become somewhat zigzagged and they extend almost to the border of the shell; later growth apparently destitute of sculpture; epidermis olivaceous; pseudocardinals and laterals granular; nacre bluish-white.

Length 37, height 23 mm.

Imbabura, Ecuador.

Castalia pazi HIDALGO, Jl. de Conch., XVI, 1868, p. 353, pl. XIII, fig. 6.

Diplodon pazi SIMPSON, Syn., 1900, p. 884.

Not so distinctly biangulate behind as *D. hylæus,* the sculpture nodulous and inclined to break up below into a zigzag pattern. I have no doubt but what this is a *Diplodon.*

DIPLODON HYLÆUS (d'Orbigny).

Shell somewhat rhomboid, solid, convex, inequilateral, with a nearly straight dorsal line; the post-dorsal slope having a straight oblique truncation; posterior ridge distinctly double below, ending behind a little above the base in a decided biangulation; post-basal region a trifle swollen; surface covered for about half way down from the beaks with strong, curved, radial ridges, one or two of the central pairs coalescing; the outer portion of the shell appears to have sulcate, concentric sculpture; epidermis greenish-brown; teeth apparently rather strong; nacre bluish-white.

Length 44, height 24, diam. 17 mm.

Bolivia; Paraguay River.

Unio hylæa d'ORBIGNY, Guer. Mag., 1835, p. 36; Voy. Am. Mer., 1843, p. 607, pl. LXIX, figs. 8, 9.

Margaron (Unio) hylæus LEA, Syn., 1852, p. 21; 1870, p. 31.

Unio hylæus SOWERBY, Conch. Icon., XVI, 1868, pl. XCIII, fig. 506.

Diplodon hylæaus SIMPSON, Syn., 1900, p. 884.

Unio guaraniana d'ORBIGNY, Guer. Mag., 1835, p. 37; Voy. Am. Mer., 1843, p. 608, pl. LXIX, figs. 10-12.

Unio guaraniana d'Orbigny seems to me to be only a young *hylæus.* The post-dorsal point is a little more elevated than that of the last named.

Group of *Diplodon parallelipipedon.*

Shell elongated, subtrapezoidal, inflated, obliquely truncate behind, posterior ridge strong; beaks rather low, sculpture of nearly or quite strictly radial bars with concave spaces between; epidermis dark; pseudocardinals compressed in the young, granular, vertically striate and breaking into denticles in the old shell; laterals long, curved, granular, often vertically striate; anterior scars smooth, distinct.

DIPLODON PARALLELIPIPEDON (Lea).

Shell greatly elongated, subrhomboid, rather solid, inflated, very inequilateral; beaks full and somewhat elevated above the dorsal line, their sculpture a few, strong, short, radial bars; posterior ridge high, angled on the earlier growth, ending behind in a point near the base line; surface having irregular, concentric sculpture; epidermis bright, dark bottle-green with narrow, concentric bands of light green; left valve with two pseudocardinals, the anterior high, rough and subcompressed, the hinder low, with two straight, granular laterals; right valve with two compressed pseudocardinals, the upper small, and one lateral having a vestigial one at its base; all the teeth showing indications of vertical striation; anterior scars deep; posterior scars impressed; nacre silvery-white, a little thicker in front.

Length 85, height 32, diam. 27 mm.

Rio de la Plata system.

Unio parallelipipedon LEA, Tr. Am. Phil. Soc., V, 1834, p. 60, pl. VIII, fig. 20; Obs., I, 1834, p. 172, pl. VIII, fig. 20.—KUSTER, Conch. Cab. Unio, 1861, p. 220, pl. LXXIV, fig. 2.—SOWERBY, Conch. Icon., XVI, 1868, pl. LXXXIX, fig. 478.

Margarita (Unio) parallelipipedon LEA, Syn., 1836, p. 35; 1838, p. 24.

Margaron (Unio) parallelipipedon LEA, Syn., 1852, p. 36; 1870, p. 58.

Diplodon parallelipipedon SIMPSON, Syn., 1900, p. 884.

Unio bonplandi VALENCIENNES, Continuation of Humboldt's Zool. Obs., 1827.

A striking, elongated species, which is remarkable for the wide, bottle-green belts alternating with narrower ones of lighter color.

DIPLODON PATAGONICUS (d'Orbigny).

Shell oblong, subrhomboid, rather solid, very inequilateral, subinflated, with a strong, rounded posterior ridge, which curves up a little in the middle and ends behind in a rounded point at the base of the shell; anterior end slightly truncated or round; base line straight or faintly incurved; surface with feeble, uneven, concentric sculpture; epidermis dark brown to jet black, scarcely shining; left valve with one or two subcompressed, rough, pseudocardinals and two laterals; right valve with two pseudocardinals, the upper smaller, and one lateral; laterals with granular vertical striæ; anterior scars deep; there is a crescent shaped scar at the base of the pseudocardinals; posterior scars large; nacre dirty bluish-white, darker in the cavities of the valves, a little thicker in front.

Length 88, height 40, diam. 27 mm.

Patagonia.

Unio patagonica d'ORBIGNY, Guer. Mag., 1835, p. 37; Voy. Am. Mer., 1843, p. 610, pl. LXX, figs. 1-4.

Margarita (Unio) patagonicus LEA, Syn., 1838, p. 25.

Unio patagonicus HANLEY, Biv. Shells, 1843, p. 208, pl. XXII, fig. 16.—REEVE, Conch. Icon., XVI, 1865, pl. XXI, fig. 93.

Margaron (Unio) patagonicus LEA, Syn., 1852, p. 38; 1870, p. 61.

Diplodon patagonicus SIMPSON, Syn., 1900, p. 885.

Not quite so decidedly pointed at the posterior base as *acutirostris;* the pseudocardinals are not so much split up and the nacre is not so clean, yet probably the two run together.

DIPLODON ACUTIROSTRIS (Lea).

Shell elongated, convex, very inequilateral; with beaks probably somewhat full; posterior ridge strong, curved upward in the middle and ending in a point at the extreme base; base line incurved in front of the hinder point; anterior end decidedly truncated and ending in a right angle above; surface unevenly, concentrically sculptured, dirty olive, not shining; there is a large pseudocardinal in each valve split up into numerous, rough, radial teeth; one lateral in each valve, that of the left somewhat double; both are granular and show traces of vertical striation; anterior scars small and deep; posterior scars oblique; nacre bluish-white, a little thicker in front.

Length 80, height 40, diam. 24 mm.

South America.

Unio acutirostris Lea, Pr. Ac. N. Sci. Phila., X, 1866, p. 34; Jl. Ac. N. Sci. Phila., VI, 1868, p. 270, pl. xxxv, fig. 84; Obs., XIII, 1869, p. 30, pl. xxxv, fig. 84.

Margaron (Unio) acutirostris Lea, Syn., 1870, p. 58.

Diplodon acutirostris Simpson, Syn., 1900, p. 885.

I am very doubtful whether this is more than a form of d'Orbigny's *patagonicus*. I have only seen one shell, the type, which is badly eroded. The teeth and nacre differ somewhat from those of specimens of that species in the Lea Collection and it is a little more decidedly truncate in front, but the differences are only of degree and there seems to be considerable difference in these characters among the shells I have seen.

Group of *Diplodon quadrans*.

Shell subtrapezoid, slightly truncate in front, nearly equilateral, greatly inflated, its greatest diameter below the beaks, from which it is wedge-shaped in front and behind, solid, with a decidedly rounded posterior ridge; epidermis brownish, concentrically striate; beaks full, but not high; ligament long and slender; pseudocardinals large, compressed, striate, and crenulate, double in the right valve, single in the left; laterals curved, crenulate; beak cavities rounded; anterior cicatrices deep, confluent; nacre white.

Animal unknown.

Diplodon quadrans (Lea).

Shell short, subrhomboid, inflated, somewhat inequilateral, rather solid; beaks full, but not very high; posterior ridge full, rounded, ending behind in a rounded point at the base; anterior end somewhat truncated, subangular above; surface strongly, concentrically striate; epidermis dark brown; pseudocardinals compressed, the anterior one in the left valve small; laterals decidedly curved; anterior muscle scars deeply impressed; posterior scars shallow; nacre white and iridescent, thickened in front.

Length 93, height 68, diam. 52 mm.

South America (?).

Unio quadrans Lea, Pr. Ac. N. Sci. Phila., IV, 1859, p. 306; Jl. Ac. N. Sci. Phila., IV, 1860, p. 360, pl. LXI, fig. 185; Obs., VIII, 1860, p. 42, pl. LXI, fig. 185.

Margaron (Unio) quadrans Lea, Syn., 1870, p. 36.

Diplodon quadrans Simpson, Syn., 1900, p. 885.

This shell, which is in the Wheatley collection, is supposed to have come from Texas. Nothing like it has been reported by any one else from that state and there seems to be nothing from the Texan or Mexican region that is in any way related to it. The umbonal region is so eroded that no traces of beak sculpture remain, but the character of the teeth, the general appearance, color and sculpture seem to ally it to the forms of South America. The greatest degree of inflation is well forward and from this it is rather regularly wedge-shaped in front and behind.

Subgenus Cyclomya Simpson, 1900.

Cyclomya Simpson, Syn., 1900, p. 886.

Shell obovate to suborbicular, narrowed in front, produced just behind the center of the base, generally slightly pointed about the middle of the posterior end, with a scarcely perceptible posterior ridge and a slight dorsal wing behind; beaks high, irregularly radial; hinge line strongly arched, curved behind and incurved in front of the beaks; the lower pseudocardinal in the right valve largest, often much split up into denticles, those of the left valve variable, generally dentilate; two lower anterior scars deep, united, the upper very deep, separate.

Animal having the gills rather short, inner the longer, united throughout to the abdominal sac, outer subangular below; palpi large, projecting behind; branchial opening large, with a few stout papillæ; anal opening separated from the branchial by a bridge, but not separated from the superanal opening.

Type, *Unio funebralis* Lea.

Section Cyclomya s. s.

Diplodon patelloides (Lea).

Shell unevenly rhomboid, short, somewhat compressed, rather solid, slightly inequilateral; beaks moderately full and elevated above the dorsal line, sculptured with radial bars; dorsal line curved in in front of the beaks and upward behind them; posterior ridge full and rounded, ending behind in a blunt point just below the median line, above this point the shell is obliquely truncated; base swelled at and behind the middle; anterior end narrowed and pointed; surface rudely and unevenly, concentrically sculptured, showing traces of radial sculpture; epidermis dark brown, scarcely shining; left valve with two compressed, ragged pseudocardinals, the hinder small, and two curved laterals; right valve with two pseudocardinals, the upper small, and one lateral; laterals granular; muscle scars well marked; nacre white, somewhat silvery, thicker in front.

Length 75, height 59, diam. 28 mm.

Amazon River.

Unio patelloides Lea, Pr. Ac. N. Sci. Phila., IV, 1860, p. 89; Jl. Ac. N. Sci. Phila., V, 1863, p. 383, pl. xliii, fig. 291; Obs., X, 1863, p. 19, pl. xliii, fig. 291.

Margaron (Unio) patelloides Lea, Syn., 1870, p. 56.

Diplodon patelloides Simpson, Syn., 1900, p. 886.

A rudely sculptured species with distinct traces of radial grooves, with a rich brown epidermis. The pseudocardinals are more compressed than those of *D. funebralis*; it is sharper in front and behind and not so swollen in the post-basal region.

Diplodon peræformis (Lea).

Shell irregularly obovate, subsolid, subinflated, inequilateral, with only moderately full or elevated beaks, whose sculpture is radial; posterior ridge well defined and subangular, ending behind in a point a little above the median line; above this point the shell is obliquely truncated; anterior end narrow and rounded; base very full just behind the middle; surface very slightly, concentrically sculptured; epidermis bottle-green; left valve with two small pseudocardinals and two remote laterals; right valve with two pseudocardinals, the upper very small, and one lateral; muscle scars shallow; nacre bluish-white.

Length 44, height 32, diam. 20 mm.

Uruguay River, South America.

Unio peræformis LEA, Pr. Ac. N. Sci. Phila., IV, 1860, p. 90; Jl. Ac. N. Sci. Phila., V, 1863, p. 384, pl. XLIII, fig. 292; Obs., X, 1863, p. 20, pl. XLIII, fig. 292.—SOWERBY, Conch. Icon., XVI, 1868, pl. LXXXIV, fig. 443.

Margaron (Unio) peræformis LEA, Syn., 1870, p. 55.

Diplodon peræformis SIMPSON, Syn., 1900, p. 886.

Probably the type, the only shell I have seen, is a young shell. It is considerably inflated and very much produced just behind the middle of the base.

DIPLODON FONTAINIANUS (d'Orbigny).

Shell unevenly obovate or subtrapezoidal, scarcely inflated, the greatest diameter being in the middle of the shell, the front part being wedge-shaped, with moderately full but not high beaks, which are situated in front of the center, the dorsal line in front of them strongly incurved; beak sculpture radial, sometimes subnodulous; posterior ridge full, rounded, ending behind in a rounded projection near the base; dorsal line curved behind the beaks, obtusely angled where it meets the posterior truncation; surface with fine, concentric growth striæ, often with faint traces of radial sculpture; epidermis greenish-brown to blackish, scarcely shining; left valve with one or two compressed pseudocardinals, the two often grown together, with two curved, remote laterals; right valve with two elongated pseudocardinals, the lower the larger, and one lateral; muscle scars shallow; nacre bluish-white, a little thicker in front.

Length of type 48, height 36, diam. 20 mm.

Length 79, height 52, diam. 28 mm.

Uruguay River and its affluents; Parana River, southern Brazil.

Unio fontainiana d'ORBIGNY, Guer. Mag., 1835, p. 36.

Unio fontainianus HANLEY, Biv. Shells, 1856, p. 384, pl. XXI, fig. 27.—SOWERBY, Conch. Icon., XVI, 1868, pl. LXXXVII, fig. 466.

Margaron (Unio) fontainianus LEA, Syn., 1870, p. 56.

Diplodon fontainianus SIMPSON, Syn., 1900, p. 886.

Unio fontaineana d'ORBIGNY, Voy. Am. Mer., 1843, p. 605, pl. LXIX, figs. 6, 7.

The type is a young shell. The species seems to show a good deal of variation in minor characters such as details of form, color and the like, but all the shells I have seen are wedge-shaped in front when viewed from above and all have elongated, compressed pseudocardinals. Those in the left valve are sometimes double, but often more or less united.

Var. *deceptus* n. v.

Shell unevenly obovate, subinflated, rather solid; left valve with two radial, short pseudocardinals, which are often split up into a number of denticles, with two remote laterals; right valve with two pseudocardinals, the upper smaller, the lower often split up, and behind it there are often small denticles on the hinge plate, with one granular lateral.

Guahyba, Brazil.

I have before me a large number of specimens of this form and a number of others, which I refer to the var. *gratus*. Both vary considerably and seem to differ constantly only in the character of the pseudocardinals. In *fontainianus* and *gratus* they are long and compressed, both are more commonly united in the left valve and though sometimes roughened they are never divided. In the form I have called *deceptus* the pseudocardinals are short and much split up, they are usually more or less radial and there are generally a number of denticles behind those of the right valve. Young shells show these characters as well as the old ones.

Var. *gratus* (Lea).

Shell more decidedly wedge-shaped in front than the type when viewed from above; epidermis smoother, lighter colored and subshining; post-dorsal wing a little more angled behind.

Uruguay River, South America.

Unio gratus Lea, Pr. Ac. N. Sci. Phila., IV, 1860, p. 91; Jl. Ac. N. Sci. Phila., V, 1863, p. 382, pl. xliii, fig. 290; Obs., X, 1863, p. 18, pl. xliii, fig. 290.—Sowerby, Conch. Icon., XVI, 1868, pl. lxxxiv, fig. 444.

Margaron (Unio) gratus Lea, Syn., 1870, p. 56.

Diplodon gratus Simpson, Syn., 1900, p. 886.

After critically comparing the type of *Unio gratus* Lea and a large amount of additional material with d'Orbigny's description and figure of *Unio fontainiana* and with what I consider authentic specimens of that form, I believe that they are mere varieties of the same thing. Lea's shell differs in being lighter colored and perhaps a little sharper on the post-dorsal angle, but the other characters seem to agree very well throughout.

Diplodon rotundus (Wagner).

Shell short obovate or subtriangular, subcompressed to slightly inflated, subsolid, inequilateral; beaks somewhat elevated, their sculpture a few, short, radial bars; post-dorsal slope raised into a low wing and more or less abruptly truncated behind; anterior end narrowed and rounded; post-basal region much produced; surface sculptured with fine, uneven concentric striæ, and having traces of radial sculpture; epidermis olive or brownish with a soft smoky tint, feebly rayed in young shells; left valve with two compressed pseudocardinals, the hinder smaller, and two curved laterals; right valve with two pseudocardinals and one lateral; dorsal scars few and deep; muscle scars small, shallow; nacre bluish-white, silvery and iridescent behind, a little thicker in front.

Length 37, height 32 mm. (figured type).

Length 67, height 55, diam. 28 mm.

Length 70, height 54, diam. 33 mm.

Brazil.

Unio rotundus Wagner, Test Fluv. Bras., 1827, p. 34, pl. xxv, figs. 3, 4.—Moricand, Mem. His. Soc. Gen., 1838, p. 49, pl. iv, figs. 12-14.—Kuster, Conch. Cab. Unio, 1856, p. 160, pl. xlvi, figs. 1, 2.—Sowerby, Conch. Icon., XVI, 1868, pl. lxxii, fig. 369.

Margaron (Unio) rotundus Lea, Syn., 1870, p. 56.
Diplodon rotundus Simpson, Syn., 1900, p. 886.

The shell figured in the Testacea Fluviatilia is apparently quite young and, if the figure is correct, it is faintly rayed. I have before me several shells which belong to the Lea Collection, which were believed by Dr. Lea to be the *Unio rotundus* of Wagner, and I am inclined to think that they are. The surface is rather smooth and shining and has a peculiar soft smoky tint. The nacre is rich and bright for a *Diplodon*.

Diplodon disculus (Lea).

Shell much compressed, subsolid, short obovate, inequilateral, with moderately full beaks, whose sculpture is irregularly radial; dorsal line incurved in front of the beaks and elevated behind them; post-dorsal region elevated into a slight wing, which is abruptly and almost squarely truncated posteriorly; posterior ridge rounded; anterior end narrowed and rounded; posterior base full; surface finely, concentrically striate; epidermis dirty green, sometimes faintly rayed; left valve with one split-up pseudocardinal and two curved laterals; right valve with two pseudocardinals, the lower dentilate or divided, and one lateral; nacre bluish, thicker in front.

Length 40, height 36, diam. 15 mm.

Length 45, height 40, diam. 15 mm.

Uruguay River, South America.

Unio disculus Lea, Pr. Ac. N. Sci. Phila., IV, 1860, p. 91; Jl. Ac. N. Sci. Phila., V, 1863, p. 385, pl. XLIV, fig. 293; Obs., X, 1863, p. 21, pl. XLIV, fig. 293.
Margaron (Unio) disculus Lea, Syn., 1870, p. 55.
Diplodon disculus Simpson, Syn., 1900, p. 887.

All the material, which I have seen, including the type, is probably young. The shell is much compressed, narrowed and rounded in front, largely produced at the post-base and widely, almost squarely truncated behind. It is much more squarely truncate behind than any closely related species.

Diplodon funebralis (Lea).

Shell nearly orbicular, but a little narrowed in front, being slightly drawn out and rounded at the upper anterior part, compressed, solid, inequilateral; dorsal line almost regularly curved from the anterior to the posterior ends, very high in the middle where it is slightly winged; beaks rather low, not elevated above the dorsal line; posterior ridge low; above it is a shallow, wide, radial depression, which ends in a feeble sinus behind; base line rounded, full behind the middle; surface with low, fine, concentric ridges, with a trace of radial sculpture; epidermis almost black, thick, scarcely shining, peeling off and showing the white shell beneath; left valve with one much-split-up pseudocardinal and two short, remote, strongly curved laterals; right valve with two pseudocardinals, the upper compressed and small, the lower dentilate, with a vestigial tooth behind it, and one curved lateral; muscle scars small; nacre white, dull, blotched in the shallow cavity, very thick along the anterior border where it is granularly, radially striate; pallial line remote from the border.

Length 76, height 67, diam. 23 mm.

Uruguay River.

Unio funebralis LEA, Pr. Ac. N. Sci. Phila., IV, 1860, p. 91; Jl. Ac. N. Sci. Phila., V, 1863, p. 378, pl. XLI, fig. 286; Obs., X, 1863, p. 14, pl. XLI, fig. 286.—SOWERBY, Conch. Icon., XVI, 1867, pl. LVII, fig. 290.

Margaron (Unio) funebralis LEA, Syn., 1870, p. 55.

Diplodon funebralis SIMPSON, Syn., 1900, p. 887.

The decided compression, the very high, curved dorsal line, the thickened nacre in front, which is granularly, radially striate, and the pallial line set far in from the border distinguish this species from others.

DIPLODON PARANENSIS (Lea).

Shell disposed to be quadrate or pentagonal, subinflated to inflated, solid, inequilateral; beaks high and somewhat full, sculptured with strong, uneven, radial ribs; area in front of them incurved, area behind them curved outward; posterior slope truncated, the outline sometimes incurved; posterior end blunt; base very much swollen at or a little behind the middle; anterior end narrow and rounded; surface covered with coarse, uneven, concentric sculpture; epidermis brownish to blackish;

pseudocardinals irregular and much split up; laterals curved, strong, two in the left valve and one in the right; muscle scars small; nacre whitish, sometimes dull purple in the cavities, much thicker in front.

Length 92, height 78, diam. 38 mm.

Length 100, height 76, diam. 47 mm.

Uruguay and Parana rivers.

Unio paranensis LEA, Tr. Am. Phil. Soc., V, 1834, pl. XIV, fig. 42; Obs., I, 1834, p. 211, pl. XIV, fig. 42.—HANLEY, Biv. Shells, 1843, p. 202, pl. XXI, fig. 3.—KUSTER, Conch. Cab. Unio, 1861, p. 253, pl. LXXXV, fig. 3.—SOWERBY, Conch. Icon., XVI, 1866, pl. LI, fig. 268.

Margarita (Unio) paranensis LEA, Syn., 1836, p. 33; 1838, p. 23.

Margaron (Unio) paranensis LEA, Syn., 1852, p. 34; 1870, p. 55.

Diplodon paranensis SIMPSON, Syn., 1900, p. 887.

Apparently abundant and quite variable in form and color of epidermis.

DIPLODON NOCTURNUS (Lea).

Shell short obovate, convex, rather solid, inequilateral, narrowed and rounded in front, full in the post-dorsal and post-basal regions; beaks somewhat elevated but not inflated; surface unevenly sulcate; epidermis dark, scarcely shining, greenish-brown, the hinder half of the shell being much darker; pseudocardinals small, two in each valve; there are two small laterals in the left valve and one in the right; muscle scars small; nacre lurid whitish, thicker in front.

Length 72, height 60, diam. 28 mm.

Uruguay River.

Unio nocturnus LEA, Pr. Ac. N. Sci. Phila., IV, 1860, p. 91; Jl. Ac. N. Sci. Phila., V, 1863, p. 380, pl. XLII, fig. 288; Obs., X, 1863, p. 16, pl. XLII, fig. 288.

Margaron (Unio) nocturnus LEA, Syn., 1870, p. 56.

Diplodon paranensis (part), SIMPSON, Syn., 1900, p. 887.

At the time I wrote the Synopsis the type of this latter shell was mislaid. Lea states in his description that it is without rays. Recently the type came to light and on carefully washing it the anterior half of the shell is seen to be bottle-green and the hinder half almost black and there are indications of a few, faint rays at the median part of the shell. This and the smaller, less split-up pseudocardinals lead me to believe that it may be distinct.

Section BULLOIDEUS Simpson, 1900.

Bulloideus SIMPSON, Syn., 1900, p. 887.

Shell rounded, inflated, thin, nearly equilateral, truncate behind and slightly so before, with a rather sharp posterior ridge and a dorsal wing; beaks full, rather high, regularly radial; epidermis smooth, bronzy-olive; pseudocardinals compressed, much elongated, disposed to be split into denticles, two in the right valve and one in the left; laterals two in the left valve and one in the right; dorsal scars few and scattered in the rather shallow cavities; nacre bluish.

Type, *Unio bulloides* Lea.

DIPLODON BULLOIDES Lea.

Shell short elliptical, almost squarely truncate behind, thin, nearly equilateral; post-dorsal line straight, meeting the truncation behind nearly at a right angle; beaks full but not greatly elevated; posterior ridge well-developed, subangular; posterior slope excavated and wrinkled; surface strongly, unevenly, concentrically sculptured, with traces of radial sculpture; epidermis yellowish-green, bronzy; left valve with one pseudocardinal and two laterals; right valve with two pseudocardinals, the upper smaller, and one lateral, all the teeth lamellar; muscle scars shallow; nacre bluish-white, rather dull.

Length 47, height 40, diam. 27 mm.

Rio de la Plata.

Unio bulloides LEA, Pr. Ac. N. Sci. Phila., III, 1859, p. 187; Jl. Ac. N. Sci. Phila., IV, 1860, p. 264, pl. XLII, fig. 144; Obs., VII, 1860, p. 82, pl. XLII, fig. 144. —KUSTER, Conch. Cab. Unio, 1861, p. 186, pl. LIX, fig. 2.—SOWERBY, Conch. Icon., XVI, 1868, pl. LXXXVIII, fig. 275.

Margaron (Unio) bulloides LEA, Syn., 1870, p. 55.

Diplodon bulloides SIMPSON, Syn., 1900, p. 887.

The only specimen I have seen, the type, is not in first class condition. It is a short elliptic shell almost squarely truncate behind, the truncation meeting the dorsal line almost at a right angle. The epidermis is a peculiar yellow-green with a bronzy hue. It is less elongated than *D. solisianus* and more truncated behind.

DIPLODON SOLISIANUS (d'Orbigny).

Shell obovate, subinflated, rather thin, wedge-shaped in front when viewed from above, nearly equilateral; beaks full and high, with strong, evenly radial bars, the central ones diverging; posterior ridge well defined, subangular, ending behind in a blunt point on the median line; above this point the shell is obliquely truncated and this truncation meets the dorsal line with an angle; anterior end somewhat narrowed and rounded; surface unevenly but strongly concentrically sculptured, with faint traces of radial sculpture, often with strong, radial ridges anteriorly; posterior slope wrinkled; epidermis dull brown; left valve with two compressed, long pseudocardinals, which are sometimes united, and two remote, curved laterals; right valve with two pseudocardinals, the upper small, and one lateral, beak cavities well impressed; muscle scars small, shallow; nacre bluish-white, dull; pallial line not impressed.

Length 72, height 53, diam. 34 mm.

Rio de la Plata and its affluents.

Unio solisiana d'ORBIGNY, Guer. Mag., 1835, p. 35; Voy. Am. Mer., 1843, p. 604, pl. LXIX, figs. 1-3.—SOWERBY, Conch. Icon., XVI, 1868, pl. XCIII, fig. 508.

Diplodon solisianus SIMPSON, Syn., 1900, p. 887.

A rather thin, obovate species with uneven, concentric and faint radial sculpture. The beak sculpture is strictly radial.

DIPLODON VARIABILIS (Maton).

Shell nearly orbicular but somewhat truncated behind, the truncation joining the nearly straight dorsal line almost at a right angle; beaks placed about at the center, full but not high, with strong, strictly radial sculpture; posterior ridge moderate; posterior slope with a faint, radial depression; surface roughly, concentrically striate; epidermis greenish-brown; pseudocardinals and laterals lamellar; nacre purplish.

Length probably 32, height 30 mm.

Rio de la Plata.

Mya variabilis MATON, Tr. Linn. Soc. Lond., X, 1811, p. 327, pl. XXIV, figs. 4-7.—WOOD, Ind. Test., 1825, p. 13, pl. II, fig. 38 *a*; rev. ed., 1856, p. 17, pl. III, fig. 38.

Unio variabilis d'ORBIGNY, Voy. Am. Mer., 1843, p. 604, pl. LXXI, figs. 1-3.—SOWERBY, Conch. Icon., XVI, 1868, pl. LXXIV, fig. 381.

Margarita (Unio) variabilis LEA, Syn., 1836, p. 33; 1838, p. 23.

Margaron (Unio) variabilis LEA, Syn., 1852, p. 35; 1870, p. 56.

Diplodon variabilis SIMPSON, Syn., 1900, p. 888.

Mytilus matoniana d'ORBIGNY, Guer. Mag., 1835, p. 35.

Unio matonianus PÆTEL, Conch. Sam., III, 1890, p. 158.

? Unio membranacea HANLEY, Biv. Shells, 1843, p. 202, pl. XXII, fig. 6.

Unio membranaceus PHILIPPI, Conch., III, 1848, p. 80, pl. V, fig. 4.—KUSTER, Conch. Cab. Unio, 1862, p. 284, pl. XCV, fig. 5.

Maton gives four figures, one of which is an interior and another is of a young shell, which I am sure belongs to a different species. His shell differs from *bulloides,* being more nearly orbicular, less sharply truncated posteriorly, in having apparently a lower posterior ridge with a feebler excavation above it and in the color of the nacre, which, he says, is purplish.

Subgenus HYRIDELLA Swainson, 1840.

Hyridella SWAINSON, Treat. on Mal., 1840, p. 380.

Beaks rather low, sculpture consisting of curved, generally nodulous ridges, which approach below but usually have a smooth area of shell between them; surface sulcate or sometimes corrugated and nodulous; epidermis rayless; teeth rather delicate, compressed, often somewhat rudimentary.

Animal having the embryos occupying the inner gills for the most part, which are united for their entire length to the abdominal sac; outer gills pointed below in the middle; palpi triangular; branchial opening papillose; anal opening smooth, not separated from the superanal opening.

Type, *Unio australis* Lamarck.

Section HYRIDELLA s. s.

Shell covered with concentric, sulcate sculpture; pseudocardinals well developed, compressed; laterals delicate, sometimes imperfect.

Group of *Diplodon dorsuosus*.

Shell somewhat rhomboid, inflated solid, with rather full beaks, the sculpture consisting of very strong, subradial, corrugated ridges, which curve toward each other below, those in the center sometimes joining, this sculpture extending well out on the disk; upper part of posterior slope having slight radial folds.

DIPLODON DORSUOSUS (Gould).

Shell oblong, subrhomboid, convex or subinflated, subsolid, inequilateral; beaks but slightly elevated, their sculpture coarse and strong, consisting of subradial, corrugated or nodulous bars, which curve towards each other; this sculpture extends out on to the disk and becomes very irregular; anterior end slightly narrowed and rounded; posterior end almost squarely subtruncated; posterior ridge full and rounded; dorsal line lightly arched; base line straight; surface with faint, irregular, concentric sculpture and traces of radial grooves; the middle of the disk is often faintly pustulous; epidermis almost black, shining; pseudocardinals compressed, more or less double in each valve; laterals remote, short; nacre bluish, much thicker in front.

Length 59, height 35, diam. 22 mm.

Length 59, height 33, diam. 19 mm.

Nepean River, Australia.

Unio dorsuosus GOULD, Pr. Bost. Soc. N. H., III, 1850, p. 296; U. S. Expl. Exp., XII, 1852, p. 430, figs. 540, 540*a*, 540*b*.

Margaron (Unio) dorsuosus LEA, Syn., 1852, p. 21.

Diplodon dorsuosus SIMPSON, Syn., 1900, p. 889.

Unio napeanensis Conrad, Pr. Ac. N. Sci. Phila., V, 1852, p. 10; Jl. Ac. N. Sci. Phila., 1854, p. 296, pl. xxvi, fig. 4.——Reeve, Conch. Icon., XVI, 1865, pl. xxiii, fig. 2.

Margaron (Unio) napeanensis Lea, Syn., 1852, p. 20; 1870, p. 30.

Distinguished by its strong and peculiar beak sculpture, which often extends one-third of the way over the disk and by having the posterior end almost squarely subtruncate. The epidermis is black and polished. The type of *Unio dorsuosus* Gould, which is before me, is a young and light-colored specimen and *napeanensis* Conrad is the adult state of the same.

Diplodon glenelgensis (Dennant).

Glenelg River, Victoria.

Unio glenelgensis Dennant, Pr. Roy. Soc. Vict., X, 1898, p. 112, pl. iv.

Diplodon glenelgensis Simpson, Syn., 1900, p. 889.

The description of this species is not accessible to me and I am therefore obliged to omit it.

Group of *Diplodon menziezi.*

Shell subrhomboid; beak sculpture not strong, consisting of broken, nodulous ridges curving toward each other below, with generally a smooth space between, not extending over the shell.

Animal as in the subgenus.

Diplodon menziezi (Gray).

Shell subelliptical or subrhomboid, compressed, rather thin, inequilateral; beaks neither high nor full, having the characteristic sculpture of the group; posterior ridge low and widely rounded; anterior end a little narrowed, rounded; dorsal and basal lines lightly curved, the latter often slightly fuller behind the middle; dorsal slope obliquely subtruncated or rounded; surface with irregular, concentric sculpture, sometimes having in addition faint, somewhat wavy, broken, radial sculpture; epidermis greenish-olive, dull or faintly shining; teeth compressed; laterals elevated, lamellar; muscle scars shallow; nacre bluish, a little thicker in front.

Length 60, height 36, diam. 14 mm.

Length 83, height 49, diam. 21 mm.

New Zealand.

Unio menziesi Gray, In Dieffenbach's N. Z., II, 1843, p. 257. —? Musgrave, Phot. Conch., 1863, pl. II, fig. 1.

Diplodon menziesi Simpson, Syn., 1900, p. 889.

Unio menziesianus Reeve, Conch. Icon., XVI, 1865, pl. XXIX, fig. 152.

Margaron (Unio) menzieni Lea, Syn., 1870, p. 46.

An exceedingly variable species, some of the mutations of which are probably worthy of varietal names. Quite a number of the specimens before me are diseased and as a result the shells are considerably distorted. Some of the normal shells are almost evenly elliptical; some are slightly obovate; still others are more or less rhomboid.

Var. *aucklandicus* (Gray).

More elongated than the typical form and subrhomboid; umbones radiately wrinkle-ridged.

Length 73, height 40.5, diam. 20 mm.

Unio aucklandica Gray, In Dieffenbach's N. Z., II, 1843, p. 257.

? *Unio aucklandicus* Sowerby, Conch. Icon., XVI, 1866, pl. XXX, fig. 156.

Margaron (Unio) aucklandicus Lea, Syn., 1870, p. 45.

Diplodon menziesi (part), Simpson, Syn., 1900, p. 889.

The above, though quite distinct typically, absolutely blends into the type.

Var. *rugulosus* n. n.

Shell small, more solid and inflated than the type.

Length 49, height 31, diam. 19 mm.

Length 53, height 34, diam. 18 mm.

Unio rugatus Hutton, Tr. N. Z. Inst., XVI, 1884, p. 216.

Diplodon menziesi var. *rugatus* Simpson, Syn., 1900, p. 889.

The name *rugatus* was applied previously to a European *Unio* by Rossmassler; hence I have changed Hutton's name to *rugulosus*. This seems to be a small form of *menziesi,* which sometimes merges into *hochstetteri.*

Var. *hochstetteri* (Dunker).

Smaller generally than the type, shorter, more blunt behind, but higher than *rugulosus.*

Length 51, height 33, diam. 10 mm.

Length 49, height 34, diam. 11 mm.

Unio hochstetteri Dunker, Mal. Bl., VIII, 1862, p. 153.—Sowerby, Conch. Icon., XVI, 1868, pl. lxxxvi, fig. 463.

Diplodon menziesi var. *hochstelleri* Simpson, Syn., 1900, p. 889.

Nearly all the specimens I have seen of this and *rugulosus* are diseased and more or less distorted.

Suter believes this to be only a pathologic form of *menziesi.* He says in a letter to the author that he has seen the same kind of disease among small *rugulosus.*

Var. *depauperatus* (Hutton).

Shell very thin, oblong, compressed; anterior end very short, rounded; posterior end slightly winged, very obliquely truncated; dorsal margin gently ascending, slightly arched; ventral margin sinuated in the middle; pseudocardinals minute, compressed, smooth, only one in the left valve; laterals low and thin.

Length 60, height 30, diam. 15 mm.

Lake Lakapuna Auckland; New Zealand.

Unio depauperatus Hutton, Tr. N. Z. Inst., XVI, 1884, p. 216.

Diplodon menziesi var. *depauperatus* Simpson, Syn., 1900, p. 890.

This may be a valid species, but as it has never been figured, so far as I am aware, and, as there do not seem to be any decided distinguishing characters to it, I place it here. I have never seen anything I could satisfactorily refer to it. Its slightly sinused base seems to be its best character.

Var. *acutus* Suter.

"Distinguished from the species by the very distinctly rostrate posterior end, the nearly total absence of radial sculpture, and by being more compressed. Only young shells show traces of radially arranged nodules near the beaks. The basal margin is generally more straight than in typical *menziesi*. The beaks are much corroded in all the specimens I have. The shell is rather thin, yellowish-brown, with strong, concentric sculpture, approaching *D. rugata* Hutton. The interior is nacreous-olive, the hinge not different from that of the species.

Length 70, height 40, diam. 16 mm." (Suter).

Type locality, Lake Omapere, New Zealand.

Diplodon menziesi subsp. *acuta* SUTER, Pr. Mal. Soc. London, VII, 1907, p. 239, pl. XXII, figs. 11, 12.

"The outline of this subspecies is very nearly that of *D. depauperata* Hutton, but the hinge is very different; it also has almost exactly the outline of *Anodonta complanata* Zeigler of Europe."

Var. *lucasi* Suter.

"Shell oblong-ovate, very much compressed, thin and fragile, inequilateral, beaks low, eroded; surface with close, strongly pronounced rest-marks and between them a few lines of growth, all close together and foliated at the anterior end. In the adult specimen the middle part has distinct, radiate, nodulous sculpture, partly V-shaped, but no such ornamentation is to be found on the young specimens. The straight dorsal margin is subparallel to the ventral margin, which is slightly sinuate; the anterior margin is angularly rounded, the posterior obliquely truncated and slightly produced. Nearly the whole shell is covered with a thin ferrugineous coating; the epidermis is olive-green, waxy. The ligament is small, not much raised. In the right valve the two pseudocardinals are compressed, small; the upper anterior tooth is a small, smooth lamella, the lower tooth is more elevated, conoidal and strongly crenate; the lateral tooth is almost straight, thin and rugose at its posterior portion. In the left valve there is a rather long, compressed, lower, anterior, rugose pseudocardinal, the upper tooth is quite rudimentary, the upper lateral tooth is a little higher and more rugose posteriorly than the other. Interior bluish-white, pearly, a little blotched with olive in the umbonal cavity, where there are rather large and deep dorsal scars. The adductor muscle scars are shallow. The young specimens are slightly winged.

Length 45, height 24, diam. 8 mm." (Suter).

Type locality, Lake Manapouri, New Zealand.

Diplodon menziesi subsp. *lucasi* SUTER, Trans. N. Z. Inst., XXXVII, 1904, p. 239, figs. 2, 3.

"This subspecies is nearest to the typical *aucklandica,* but is distinguished from it by its exceptionally compressed form, the thinness of the shell, the strongly marked and close, concentric lines, the more tapering posterior margin, and the feebly developed pseudocardinals. The radiate, nodulous sculpture is found in many specimens of *menziesi* and its subspecies."

DIPLODON WAIKARENSIS (Colenso).

An unfigured species having the posterior slope keeled, sharp, the primary tooth large and much crested. It is a large form having a length of 88 millimeters and a height of 57. According to Suter it lives in quiet, pure water and he believes it to be a variety of *D. menziezi.* I am inclined to think it distinct on account of the keeled posterior slope. The description of this species is inaccessible to me at present.

Suter (l. c.), says that Colenso's diagnosis is incorrect, and that the shell is not keeled. He considers it a synonym of *menziezi.*

Waikare Lake, New Zealand.

Unio waikarensis COLENSO, Tasm. Jl. N. Sci., II, 1845, p. 250, footnote.

Diplodon waikarensis SIMPSON, Syn., 1900, p. 890.—SUTER, Trans. N. Z. Inst., XXXVII, 1904, p. 235.

DIPLODON ZELEBORI (Dunker).

Shell long rhomboid, rather solid, convex or subcompressed, inequilateral; beaks small, sharp, with subnodulous, curved, subradial ridges; posterior ridge narrowly rounded above, widely rounded below and ending in a blunt point at the base of the shell; there is in most cases a sort of low, short, radial anterior ridge at the umbonal region and between this and the posterior ridge there is a radial depression; surface with irregular, concentric sculpture; occasionally showing faint corrugations on the disk; epidermis thick, blackish sometimes tinted brownish or greenish; pseudocardinals small, stumpy in old shells, but compressed in young ones; laterals granular; nacre bluish, thicker in front.

New Zealand.

Unio zelebori DUNKER, Reise der Nov., 1867, p. 15, pl. II, fig. 28.

Margaron (Unio) zelebori LEA, Syn., 1870, p. 52.

Diplodon zelebori SIMPSON, Syn., 1900, p. 890.

Close to varieties of *menziesi*, but solider and more evenly long rhomboid. The epidermis is darker and thicker than in that species, the median radial impression on the umbonal region is peculiar; the pseudocardinals in an adult state are stumpy, while in *menziesi* they are compressed. This species shows a few well-impressed dorsal scars.

DIPLODON FLYENSIS (Tapperone Canefri).

Shell short rhomboid, convex, apparently rather thin, inequilateral; beaks but slightly elevated; anterior end regularly rounded, a little narrower than the posterior end; basal and dorsal lines nearly straight; dorsal slope obliquely subtruncate, curving into the dorsal region; surface densely and delicately, concentrically striate; epidermis fuscous-olive; pseudocardinals small, short, subcompressed; laterals lightly arcuate; nacre flesh-white, iridescent.

Length 49, height 35, diam. 19 mm.

Fly River, New Guinea.

Unio flyensis TAPPERONE CANEFRI, Ann. Mus. Genov., XIX, 1883, p. 293, fig. 1.

Diplodon flyensis SIMPSON, Syn., 1900, p. 890.

I have never seen this species, but the excellent figures by its author show it to be a *Diplodon* without doubt and closely related to the forms of Australia. The other Papuan Unionidæ are evidently most nearly related to species of Southeastern Asia. The presence of this true *Hyridella* in Papuan waters is another point in favor of the theory of a recent connection of this great island with Australia by way of Torres Straits.

DIPLODON VITTATUS (Lea).

Shell subelliptical or subrhomboid, convex or subinflated, subsolid, inequilateral; beaks slightly elevated and inflated; posterior ridge rounded or feebly double; surface very finely, concentrically striate; epidermis yellowish-olive, with dark, narrow rest marks, subshining; teeth rather delicate; pseudocardinals compressed; laterals curved; nacre whitish to dirty purplish, iridescent behind, thickened in front.

Length 64, height 43, diam. 25 mm.

Length 56, height 36, diam. 21.5 mm.

Australia.

Unio vittatus LEA, Pr. Ac. N. Sci. Phila., III, 1859, p. 153; Jl. Ac. N. Sci. Phila., IV, 1860, p. 249, pl. XXXVIII, fig. 128; Obs., VII, 1860, p. 67, pl. XXXVIII, fig. 128.—REEVE, Conch. Icon., XVI, 1864, pl. XXIII, fig. 83.

Margaron (Unio) vittatus LEA, Syn., 1870, p. 35.

Diplodon vittatus SIMPSON, Syn., 1900, p. 890.

The type of this shell is not in the Lea collection, but a specimen presented by Mr. Cuming to Dr. Lea is. It differs considerably from the type, being subrhomboid, somewhat narrowed in front, in having short pseudocardinals and lurid purplish nacre, while the type is nearly elliptical, has somewhat elongated pseudocardinals and white nacre. Both agree in the external color, a sort of yellowish-olive with well-defined, dark rest marks and in this character differ from *australis*, to which it seems to be closely allied.

DIPLODON LESSONI (Kuster).

Shell oblong, a little narrower in front, inequilateral, subinflated; dorsal outline somewhat arched; base line nearly straight; anterior end rounded; posterior end widely and almost squarely subtruncated; epidermis nearly black; surface concentrically sulcate striate; pseudocardinals conical; laterals elongated, lightly curved; nacre bluish-white, shining.

Length 69, height 41, diam. 25 mm.

New South Wales.

Unio lessoni KUSTER, Conch. Cab., 1856, p. 135, pl. XXXVI, fig. 4.

Diplodon lessoni SIMPSON, Syn., 1900, p. 890.

Unio australis KUSTER, Conch. Cab., 1861, p. 230, pl. LXXVII, fig. 6.

I am not at all sure that this is not *D. napeanensis.* The figures are taken from specimens in which the umbonal region is badly eroded. The shape of the shell, its color and that of the epidermis agree closely with the same characters in *napeanensis,* but the pseudocardinals are represented as conical. In the latter species they are compressed or subcompressed in all the specimens I have seen.

DIPLODON AUSTRALIS ("Lamarck," Hanley).

Shell elliptical, slightly obovate or subrhomboid, thin to subsolid, convex to inflated, more or less inequilateral; beaks moderately full and elevated, their sculpture not observed; posterior ridge but little elevated, subangular or rounded; there is often a sort of low, wide, radial ridge at some distance in front of the posterior ridge, the base line being full where it ends; surface with rather strong, irregular, concentric sculpture; epidermis pale olive to dark brownish, scarcely shining; pseudocardinals compressed, one in each valve, with sometimes a feeble second one in the right valve; laterals delicate, remote, often short, single in the right valve, often double in the left: muscle scars shallow; nacre dull, whitish or bluish, sometimes a little thicker in front.

Length 62, height 41, diam. 24 mm.

Length 67, height 42.5, diam. 28 mm.

Australia; Tasmania.

Unio australis LAMARCK, An. sans. Vert., VI, 1819, p. 80.—HANLEY, Biv. Shells, 1843, p. 192, pl. XXI, fig. 25.—PHILIPPI, Conch., III, 1848, p. 81, pl. V, fig. 5.

Margarita (Unio) australis LEA, Syn., 1836, p. 25; 1838, p. 19.
Hyridella australis SWAINSON, Tr. on Mal., 1840, p. 285.
Margaron (Unio) australis LEA, Syn., 1852, p. 28; 1870, p. 44.
Diplodon australis SIMPSON, Syn., 1900, p. 890.
? Unio depressus LESSON, Voy. Coquille, 1830, II, p. 427, pl. XV, fig. 5.
Margarita (Unio) depressus LEA, Syn., 1836, p. 32; 1838, p. 22.
Margaron (Unio) depressus LEA, Syn., 1852, p. 33; 1870, p. 54.
Unio ambiguus PHILIPPI, Conch., III, 1847, p. 47, pl. III, fig. 2. —SOWERBY, Conch. Icon., XVI, 1868, pl. LXIX, fig. 355.
Unio shuttleworthi KUSTER, Conch. Cab. Unio, 1856, p. 152, pl. XLIV, fig. 2.
Unio philippianus KUSTER, Conch. Cab. Unio, 1861, p. 235, pl. LXXIX, fig. 2.
Unio balonnensis CONRAD, Pr. Ac. N. Sci. Phila., V, 1850, p. 10; Jl. Ac. N. Sci. Phila., II, 1854, p. 295, pl. XXVI, fig. 3.
? Unio daniellii VILLA, Jl. de Conch., XIX, 1871, p. 328.
Unio bednalli TATE. Where?

Apparently an abundant, widely distributed species, and quite variable. The exterior is usually somewhat strongly and irregularly sculptured, the epidermis is pale olive to brownish, the teeth are small and sometimes almost feeble.

Var. *legrandi* (Petterd).

This form is larger than *australis* and in some cases a solider shell. Two shells from Tasmania bearing the name *Unio legrandi* from Suter appear to be but a variety of *australis*. One of them is obovate, quite solid and dark, the other is subrhomboid, thinner and lighter colored. A third shell, which is probably this, is labeled "Australia" and is obovate and rhomboid.

Length 96, height 60, diam. 35 mm.

Length 78, height 50, diam. 28 mm.

Australia; Tasmania.

Unio depressus REEVE, Conch. Icon., XVI, 1864, pl. XVIII, fig. 81.

Unio legrandi PETTERD, Pr. R. Soc. Tasm., 1887, p. 22; 1888, p. 81.

Diplodon australis var. *legrandi* SIMPSON, Syn., 1900, p. 891.

DIPLODON JEFFREYSIANUS (Lea).

Shell subrhomboid, convex, subsolid or rather thin, somewhat inequilateral; beaks slightly elevated, scarcely inflated; anterior end rounded; base and dorsal lines lightly curved; posterior end obliquely subtruncate; posterior ridge low, rounded; above it there are one or two low, rather wide, radial ridges; surface with close, fine, concentric sculpture; epidermis pale ashy brownish to brownish-olive, subshining; teeth delicate, compressed; pseudocardinals double in the left valve, single in the right; laterals single in each valve, remote; muscle scars shallow; nacre bluish-white or flesh-colored.

Length 73, height 45, diam. 23 mm.

Australia.

Unio jeffreysianus LEA, Pr. Ac. N. Sci. Phila., I, 1871, p. 188; Jl. Ac. N. Sci. Phila., VIII, 1874, p. 23, pl. VII, fig. 20; Obs., XIII, 1874, p. 27, pl. VII, fig. 20.

Diplodon jeffreysianus SIMPSON, Syn., 1900, p. 891.

The type consists of two matched valves and I am a little dubious as to whether the species is a valid one. One valve, the right, is darker, more strongly sulcate, and duller colored than the left. This matched pair is considerably more compressed than any specimens I have seen of *australis,* and it has the super-posterior ridges, which I have not seen in that shell.

DIPLODON PROFUGUS (Gould).

Shell oblong, narrowed a little in front, subrhomboid, subcompressed or convex, subsolid; beaks somewhat nearer the anterior end, rather full; posterior ridge low, rounded; anterior end rounded; dorsal and basal outlines lightly curved or nearly straight; surface with irregular, strong, concentric sculpture; epidermis dirty greenish; teeth delicate; pseudocardinals double in each valve; laterals remote; nacre bluish or flesh-colored, thicker in front.

Length 75, height 42, diam. 22 mm.

Hunter's River, New South Wales.

Unio profugus Gould, Pr. Bost. Soc. N. H., 1850, p. 295; U. S. Expl. Exp., XII, 1852, p. 429, figs. 543, 543*a*, 543*b*.

Margaron (Unio) profugus Lea, Syn., 1852, p. 29.

Diplodon profugus Simpson, Syn., 1900, p. 891.

A single right valve labeled "Type" from Hunter's River, New South Wales, is in the National Museum collection, besides a smaller shell from Paramatta, which is shorter in proportion. I am somewhat doubtful as to the validity of this species. The type is more elongated, more compressed, and rather lighter colored than any specimens of *australis* I have seen, but the outline of the smaller shell is intermediate between the two.

Diplodon moretonicus (Reeve).

Shell subrhomboid, oblong, somewhat inequilateral; beaks moderately full; posterior ridge well developed, rounded, ending in a broadly rounded point at the base of the shell; dorsal line lightly curved; anterior end rounded; base line straight; dorsal end obliquely striate; epidermis fuscous-black.

Length of figure 71, height 42.5 mm.

Tasmania.

Unio moretonicus Reeve, Conch. Icon., XVI, 1865, pl. xxiv, fig. 118.

Diplodon moretonicus Simpson, Syn., 1900, p. 891.

Margaron (Unio) mortonicus Lea, Syn., 1870, p. 43.

While Reeve's figure is a good one, his description of this species is utterly inadequate. It is quite probable that he had before him a *Unio obesus blandingianus* from Florida, as his figure and brief, incomplete description absolutely agree with that.

Diplodon culteliformis (Conrad).

Shell somewhat elongate, subelliptical, subobovate or slightly rhomboid, inequilateral, scarcely subsolid, compressed; beaks neither full nor high, with subradial, curved bars, which draw towards each other below; posterior ridge full, rounded, ending in a point below the median line; dorsal and ventral lines lightly curved or nearly straight, the latter often full behind the middle; anterior end slightly narrowed, rounded; dorsal slope obliquely truncate; surface with fine, concentric sculpture, sometimes with feeble, radial markings in front; epidermis greenish-brown; pseudocardinals compressed, disposed often to be double in each valve; nacre bluish, thicker in front.

Length 59, height 29, diam. 19 mm.

Australia.

? *Unio depressa* LAMARCK, An. sans. Vert., VI, 1819, p. 79.—? DELESSERT, Rec. Coq. Lam., 1841, pl. XII, fig. 5.—CHENU, Ill. Conch., 1858, pl. XII, figs. 4, 4*a*.

Unio depressus CONRAD, Jl. Ac. N. Sci. Phila., 1854, p. 295, pl. XXXVI, fig. 2.

Unio cultelliformis CONRAD, Pr. Ac. N. Sci. Phila., V, 1850, p. 10.

Margaron (Unio) cultelliformis LEA, Syn., 1852, p. 32; 1870, p. 52.

Diplodon cultelliformis SIMPSON, Syn., 1900, p. 892.

Unio paramattensis LEA, Pr. Ac. N. Sci. Phila., VI, 1862, p. 176; Jl. Ac. N. Sci. Phila., VI, 1866, p. 60, pl. XX, fig. 59; Obs., XI, 1867, p. 64, pl. XX, fig. 59.

Margaron (Unio) paramattensis LEA, Syn., 1870, p. 35.

Conrad's description of *Unio cultelliformis* agrees exactly with Lea's *U. paramattensis,* numerous authentic specimens of which are before me.

I cannot identify Lamarck's *Unio depressus* with any certainty from his very meager description. As the name *depressus* was used for a *Unio* in 1801 by Donovan I am obliged to use another for this.

DIPLODON LUTULENTUS (Gould).

Shell elongated, subrhomboid, compressed, quite inequilateral, sometimes slightly falcate, subsolid; beaks low; posterior ridge low, widely rounded; anterior end slightly narrower than the posterior, rounded; dorsal and ventral lines nearly straight and parallel; dorsal slope slightly and obliquely subtruncate; surface covered with fine, irregular, concentric sculpture, often slightly corrugated or subnodulous on the disk; epidermis in young shells clouded, greenish, yellowish and brownish, darker in old shells; pseudocardinals small, subcompressed in young shells, becoming stumpy and often faint in old shells; laterals lamellar; nacre bluish, iridescent and thin behind, thick in front; dorsal scars few, distinct.

Length 61.5, height 28, diam. 12.5 mm.

Length 58, height 31.5, diam. 14.5 mm.

New Zealand, common according to Gould.

Unio lutulentus Gould, Pr. Bost. Soc. N. Hist., III, 1850, p. 295; U. S. Expl. Exp., XII, 1852, p. 428, figs. 542, 542*a*, 542*b*, 542*c*.—Reeve, Conch. Icon., XVI, 1865, pl. xxv, fig. 122.

Margaron (Unio) lutulentus Lea, Syn., 1852, p. 32; 1870, p. 52.

Diplodon lutulentus Simpson, Syn., 1900, p. 892.

A puzzling form, which in some cases approaches dangerously close to forms of *menziesi*. There are three valves in the National Museum collection marked "Type," which do not agree very closely with the figures in Gould's Atlas. The figures show a rather brightly colored shell, while these valves are dull and, as is often the case with this species, coated with a deposit of oxide of iron. The description tallies well with other shells in the National Museum collection collected by the Wilkes' Exploring Expedition. In general the species is more elongated than any of the forms of *menziesi*, more solid, has shorter pseudocardinals, which become stumpy and faint with age. The nacre is more strongly and suddenly thickened in front in this shell.

Diplodon wilsonii (Lea).

Shell oblong, elliptical, convex, inequilateral, thin; beaks rather full, sharp; posterior ridge low, rounded; dorsal and basal outlines very slightly curved, nearly parallel; anterior and posterior ends rounded, the latter a little produced on or below the median line; surface delicately, concentrically striate; epidermis pale olive-green, feebly rayed and having a metallic luster, sometimes banded; teeth very delicate, compressed; pseudocardinals double in the right valve, single in the left; laterals double in the left valve, single in the right; nacre bluish-white, iridescent.

Length 52, height 24.5, diam. 13.5 mm.

Australia.

Unio wilsonii LEA, Pr. Ac. N. Sci. Phila., 1859, p. 153; Jl. Ac. N. Sci. Phila., IV, 1860, p. 257, pl. XL, fig. 137; Obs., VII, p. 74, pl. XL, fig. 137.—SOWERBY, Conch. Icon., XVI, 1868, pl. LXXXVIII, fig. 474.

Margaron (Unio) wilsonii LEA, Syn., 1870, p. 47.

Diplodon wilsonii SIMPSON, Syn., 1900, p. 892.

Unio (Alasmodon) stuarti ADAMS and ANGAS, Pr. Zool. Soc. Lond., 1863, p. 417.

Unio stuarti SOWERBY, Conch. Icon., XVI, 1866, pl. LIV, fig. 279.

Anodon stuarti SOWERBY, Conch. Icon., XVII, 1867, pl. XXXIV, figs. 136, 136*a*, 136*b*.

Margaron (Unio) stuarti LEA, Syn., 1870, p. 52.

Margaritana stuarti PÆTEL, Conch. Sam., III, 1890, p. 174.

Anodonta stuarti PÆTEL, Conch. Sam., III, 1890, p. 185.

A delicate, somewhat shining species with a slight metallic luster and having compressed, rather feeble teeth. A specimen from the Stuart Expedition labeled *Unio stuarti* Adams and Angas, agrees perfectly with Lea's figures and description of *U. wilsonii* and with the description of Adams and Angas of *Unio (Alasmodon) stuarti*, and Sowerby's *Unio stuarti* and *Anodon stuarti*. The original description states that the shell is plicate posteriorly and one of the National Museum shells shows traces of plication in that region. Another specimen whose beaks are somewhat eroded, shows traces of radial sculpture.

DIPLODON EVANSI (Adams and Angas).

Shell short, elliptic rhomboid, or subquadrate, thin, scarcely inflated or convex, inequilateral; beaks full and somewhat elevated; posterior ridge rounded; dorsal outline nearly straight.

with a low wing, behind which it is bluntly, obliquely truncate on the dorsal slope: anterior end rounded, subangulate above; base line curved, fullest behind the middle; surface with finely striated epidermis and showing in the middle of the disk a few, subradial or oblique markings; teeth delicate, compressed; pseudocardinals double in the right valve and single in the left; laterals double in the left valve, single in the right; nacre bluish or purplish, rich and brilliant.

Length 53, height 37 mm.

Lagoon of the Lower Murray River, Australia.

Unio (Alasmodon) evansi ADAMS and ANGAS, Pr. Zool. Soc. Lond., 1864, p. 39.

Unio evansi SOWERBY, Conch. Icon., XVI, 1867, pl. LVI, fig. 285.

Margaron (Unio) evansi LEA, Syn., 1870, p. 56.

Margaritana evansi PÆTEL, Conch. Sam., III, 1890, p. 173.

Diplodon evansi SIMPSON, Syn., 1900, p. 892.

A single young specimen labeled *Unio evansi* Adams and Angas is in the Lea Collection without locality and it agrees well with the original description of that species and with Sowerby's figure of it.

Section CUCUMARIA Conrad, 1853.

Cucumaria CONRAD, Pr. Ac. Nat. Sci. Phila., VI, 1853, p. 269.

Cucumeria SIMPSON, Syn., 1900, p. 893.

Shell elongated, trapezoidal, widest behind; pseudocardinals irregular, small, not well developed, showing a tendency to break into denticles; laterals feeble; pallial line strongly pitted; nacre much thicker in front.

Type, *Unio novæ-hollandiæ* Gray.

Group of *Diplodon novæ-hollandiæ*.

Shell having the posterior two-thirds overed with irregular nodules, which radiate somewhat from the posterior ridge.

DIPLODON NOVÆ-HOLLANDIÆ (Gray).

Shell much elongated, subcompressed or scarcely subinflated, rhomboid, somewhat solid; inequilateral, a little narrower in front; beaks probably not much elevated or inflated; posterior ridge full, rounded; anterior end rounded, cut away a little below; base line nearly straight; posterior end obliquely truncate above, rounded below; surface with uneven, concentric sculpture, the hinder two-thirds covered with irregular pustules, which are strongest on the posterior part of the shell; sometimes they are arranged in broken ridges; epidermis brownish or blackish; left valve with two small, stumpy pseudocardinals and two remote, faint laterals; right valve with two pseudocardinals, the upper very small, and one remote lateral; dorsal scars few, well exposed in the shallow beak cavities; adductor scars shallow, the small ones immediately under the pseudocardinals, deep; pallial line crenated; nacre dirty bluish, often lurid purple in the cavities, much thicker on the anterior base.

Length 132, height 50, diam. 32 mm.

Australia.

Unio novæ-hollandiæ GRAY, Pr. Zool. Soc. Lond., 1834, p. 57.

Margarita (Unio) novæ-hollandiæ LEA, Syn., 1836, p. 17; 1838, p. 16.

Margaron (Unio) novæ-hollandiæ LEA, Syn., 1852, p. 23; 1870, p. 35.

Diplodon novæ-hollandiæ SIMPSON, Syn., 1900, p. 893.

Unio cucumoides LEA, Proc. Am. Phil. Soc., 1840, p. 285; Tr. Am. Phil. Soc., VIII, 1842, p. 192, pl. VII, fig. 2; Obs., III, 1842, p. 30. pl. VII, fig. 2.—HANLEY, Biv. Shells, Sup., 1856, p. 382, pl. XXIV, fig. 4.—CHENU, Ill. Conch., 1858, pl. XXVII, figs. 3, 3*a*, 3*b*.—KUSTER, Conch. Cab. Unio, 1861, p. 219, pl. LXXIV, fig. 1.—REEVE, Conch. Icon., XVI, 1865, pl. XIX, fig. 89.

Margaron (Unio) cucumoides LEA, Syn., 1852, p. 21; 1870, p. 31.

? *Unio cumingianus* DUNKER, Zeits. für Mal., 1853, p. 53.

A striking species, which differs from *D. websteri* in being more elongated, narrower in proportion in front, in having a higher posterior ridge, along which lies its greatest diameter, and in having the anterior two-fifths of the shell nearly free from nodules. The line of juncture between the noduled and non-nodulous area runs obliquely nearly parallel with the posterior ridge.

Group of *Diplodon shuttleworthii.*

Beak sculpture consisting of strong, irregularly radiate, curved, nodulous bars; surface of shell somewhat sulcate, but not nodulous.

DIPLODON SHUTTLEWORTHII (Lea).

Shell much elongated, rather solid, scarcely subinflated, subrhomboid, inequilateral: beaks low, subcompressed, sculptured with radial bars, which curve towards each other; posterior ridge elevated, rounded above, sometimes more or less double below; dorsal line slightly curved; base line nearly straight; anterior end narrowed, rounded, often cut away below; dorsal slope obliquely truncated; lower part of dorsal end rounded or feebly biangulate; surface with rather strong, concentric sculpture; posterior part of the shell covered with strong, subradial, more or less nodulous, ribs; epidermis thick, blackish, rather dull; pseudocardinals weak, often smooth and almost obsolete in old shells; laterals remote, single and elevated in the right valve, double and feeble in the left; dorsal scars distinct; anterior scars double, impressed; posterior scars elongated; pallial line crenated; nacre bluish to lurid purplish, thicker in front.

Length 132, height 51, diam. 31 mm.

Australia.

Unio shuttleworthii LEA, Pr. Ac. N. Sci. Phila., VIII, 1856, p. 94; Jl. Ac. N. Sci. Phila., III, 1857, p. 304, pl. XXVIII, fig. 19; VI, 1857, p. 24, pl. XXVIII, fig. 19.—SOWERBY, Conch. Icon., XVI, 1866, pl. XXXII, fig. 167.

Margaron (Unio) shuttleworthii LEA, Syn., 1870, p. 36.

Diplodon shuttleworthii SIMPSON, Syn., 1900, p. 893.

? Unio mutabilis REEVE, Conch. Icon., XVI, 1865, pl. XXIV, fig. 112.

Unio angasi Sowerby, Conch. Icon., XVI, 1867, pl. LV, fig. 282.
Margaritana angasi Pætel, Conch. Sam., III, 1890, p. 172.
Anodonta angasi Pætel, Conch. Sam., III, 1890, p. 176.

A most striking species, which until lately has appeared to be quite distinct from any other. The sculpture of the posterior part of the shell extends forward to an oblique line in front of and nearly parallel with the posterior ridge covering over half of the shell. In some specimens there is more or less feeble, nodulous sculpture in front of this line. The dark thick epidermis is inclined to peel off; the pallial line is decidedly crenate.

DIPLODON WEBSTERI Simpson.

Shell long rhomboid, compressed, inequilateral, subsolid when young, rather solid when old; beaks low, subcompressed, pointed, their sculpture consisting of a few, curved, subradial, broken bars; anterior end rounded, developed almost into an angle above; base line nearly or quite straight, parallel with the dorsal line; posterior end rounded below, obliquely truncate above, the point of junction of this truncation with the dorsal line almost angulate; posterior ridge low and rounded; surface with strong, irregular, concentric growth lines and covered throughout with pustules; these are strongest and somewhat lachrymose on the disk in front of the posterior ridge; in young shells there is a short row of strong, irregular knobs on the posterior ridge; epidermis yellowish-ash to dark brown or blackish-clouded green in young shells, nearly uniform black in old ones; left valve with two small, subcompressed, granular pseudocardinals and two remote, straight laterals, the upper the stronger; right valve with two pseudocardinals, the upper small, with one lateral; dorsal scars few, placed well below the hinge line; adductor scars shallow; nacre bluish-white, blotched in the cavities, greatly thickened on the anterior base in old shells.

Length 67, height 33, diam. 14 mm.

Waiuku, New Zealand.

Diplodon websteri Simpson, Naut., XVI, 1902, p. 30.—Dall, Proc. U. S. Nat. Mus., XXXV, 1908, p. 181, pl. XXX, figs. 1, 2.

This species is evidently very closely related to *D. novæ-hollandiæ* Gray, but it differs from it in being more compressed, shorter, in having its dorsal and ventral outlines more nearly parallel, and in being covered with pustules throughout. In that species the strongest sculpture is on and behind the posterior ridge; in *websteri* the nodules of this region are faint and low. Mr. Webster, who sent me specimens, states that they are not adult, but that he has one four inches in length.

Diplodon mutabilis (Lea).

Shell much elongated, widest behind, subrhomboid or subtrapezoid, rather thin, compressed, inequilateral; beaks but little elevated, subcompressed, showing somewhat extended, curved, subradial, slightly nodulous bars; posterior ridge full, widely rounded, ending in a blunt point at the base of the shell; base slightly incurved medially, full behind the middle; dorsal line curved; anterior end narrowed, rounded; dorsal slope obliquely truncated; surface nearly smooth, brownish-olive; teeth rather feeble; pseudocardinals short, somewhat dentilate; laterals nearly straight; nacre bluish, a little thicker in front.

Length 55, height 26, diam. 13 mm.

Murray River, Australia.

Unio mutabilis Lea, Pr. Ac. N. Sci. Phila., III, 1859, p. 152; Jl. Ac. N. Sci. Phila., IV, 1860, p. 248, pl. xxviii, fig. 127; Obs., VII, 1860, p. 66, pl. xxxviii, fig. 127.

Margaron (Unio) mutabilis Lea, Syn., 1870, p. 53.

Diplodon mutabilis Simpson, Syn., 1900, p. 894.

The type is not in the Lea Collection, which contains two smaller shells. It is much more elongated and narrowed in front than *paramattensis* and the base is more nearly straight.

Subgenus Lævirostris Simpson, 1900.

Lævirostris Simpson, Syn., 1900, p. 894.

Shell irregularly quadrate, thin, inequilateral, compressed, rounded and narrowed in front, somewhat biangulate and truncate behind; beaks rather low, without sculpture; surface finely, concentrically grooved; epidermis delicately lamellated and serrate; pseudocardinals small; laterals elongated; anterior muscle impressions small, well marked; posterior scars superficial; nacre bluish-white.

Animal unknown.

Type, *Unio stagnorum* Dautzenberg.

DIPLODON STAGNORUM (Dautzenberg).

Shell irregularly obovate, compressed or convex, thin, inequilateral; beaks but slightly full or elevated, apparently without sculpture; anterior end cut away above and below and produced forward into a rounded point; posterior end widened, irregularly rounded; dorsal and basal outlines curved; posterior ridge widely rounded; surface concentrically sculptured; epidermis brownish, finely lamellate; pseudocardinals small, apparently not well developed; laterals elongated, delicate, curved; nacre bluish-white, brilliant.

Length 48, height 33, diam. 17.5 mm.

Congo River, Africa.

Unio stagnorum DAUTZENBERG, Bull. Acad. Belg., XX, 1890, p. 372, pl. 1, figs. 7, 10.

Diplodon stagnorum SIMPSON, Syn., 1900, p. 894.

A peculiarly shaped species, having the anterior end produced forward on the median line to a blunt point, and the posterior end wide and irregularly rounded. Dautzenberg states that the beaks are smooth. I am inclined, from his careful description and figures, to place the species in the genus *Diplodon*.

SPECIES INCERTÆ SEDIS.

DIPLODON PANCO von Ihering.

"Shell of moderate size, solid, more or less oval or oblong in outline and somewhat inflated. The anterior end is smaller than the posterior and quite evenly rounded, whereas the posterior is obliquely truncate. Dorsal margin slightly convex, postero-dorsal angle obtusely rounded, posterior margin oblique, nearly straight. Ventral margin almost straight, slightly convex in the centre. Beaks not prominent, much eroded, in front of them at the anterior end of the dorsal margin is a small lunule 2-2.4 mm. in width. The ligament does not reach to the end of the dorsal margin. Epidermis smooth, blackish-brown, alternating with black, polished, elevated, concentric zones, between which are the remnants of numerous, lamellar, concentric growth-lines. The greatest diameter is at about the centre of the total length and the anterior portion of the shell towards the beaks is somewhat flattened. Nacre bluish-white, thicker in front. The two cardinal teeth of the right valve are almost lamellar but rather thick and straight, the laterals are straight in the middle but oblique at both ends. The cardinal tooth of the left valve is incurved on the lower side.

Length 55, height 33, diam. 22 mm." (von Ihering).

Type locality, Rio Panco, a tributary of the Rio Doce in Espirito Santo, Brazil.

Diplodon panco VON IHERING, Abh. Senck. Naturf. Ges., 32, 1910, p. 132, pl. 12, figs. *6a-b*.

"Other specimens vary somewhat in form. A low posterior ridge is sometimes developed. The size of the lunule is also a variable feature. The nacre in some shells is a pale yellowish-red towards the ventral margin. The beak sculpture consists of from 12 to 13 broad, rounded ridges, of which the seventh and eighth meet at an acute, V-shaped angle."

DIPLODON GARBEI von Ihering.

"Shell solid, thick-set, with widely separated beaks. The specimen figured has the beaks greatly eroded and in front of them a colossal, broad lunule 8 mm. in diameter. The anterior end is very short, rather low and regularly rounded. The hinder end is obliquely truncate, extending down in a decided, rounded, post-basal point. Ventral margin concave in the middle, but becoming convex as it approaches the posterior point. The dorsal margin is bent sharply downwards in front of the beaks, behind them slightly convex. Epidermis blackish-brown, shining, occasionally with squamose growth-lines and here and there with fine, radial wrinkles. A moderate keel extends from the beaks to the hinder end. The cardinal teeth are sublamellar, but quite solid and jagged. The lateral teeth are strongly curved and very long, so that, especially in the left valve, they reach beyond the obtuse postero-dorsal angle. The muscular impressions are deep; that of the upper anterior retractor lies at the base of the cardinal tooth, that of the under retractor is confluent with that of the adductor. The nacre is white with irregular, oily spots.

Length 39, height 25.5, diam. 20.5 mm." (von Ihering).

Vicinity of Rio Doce on the Rio Sao Jose and the Lagoa Jupurana, Brazil.

Diplodon garbei VON IHERING, Abh. Senck. Naturf. Ges., 32, 1910, p. 133, pl. 12, figs. *7a-b*.

"The numerous specimens vary considerably in form, according as the posterior end is round or pointed. Presumably this is owing to sexual dimorphism. The width of the lunule is also subject to considerable variation. The beak sculpture consists of ten or twelve short, radial ridges, of which the seventh and eighth meet at a sharp angle. In proportion to the size of the shell these radial ridges are very short and therefore quickly disappear owing to the erosion of the beaks. The largest examples are from 42-43 mm. long. This species stands quite isolated among the known species of Brazilian *Uniones*."

DIPLODON HARTWRIGHTI von Ihering.

"Shell of medium size, nearly oval, moderately inflated and rather thin-shelled. Anterior end slightly pointed and regularly rounded. The dorsal margin is slightly convex, almost straight, the ventral margin convex, the height being greatest at the last fourth of the length of the shell and from there it ascends to the pointed posterior end. The obliquely truncate posterior end is biangulate by reason of the well-developed posterior ridge. The growth-lines are very close and in the middle of the disk fine and thread-like, becoming wavy and lamellose posteriorly. The beaks are eroded, but the remnants or radial sculpture are visible. Epidermis dark olive-green, almost black, with here and there fine, radiating grooves extending from the beaks. The greatest diameter is nearly in the middle of the shell. Nacre very iridescent. In the right valve are two lamellar cardinal teeth and a slender lateral; in the left valve the cardinal tooth has an auxiliary lamella above it, separated by a groove. Above the lateral of the right valve, towards the hinder part, is a slender lamella representing a rudimentary second lateral. The beaks rise but little above the narrow hinge. The muscular impressions are not very deep, especially the posterior ones; the anterior retractor scar is separate and distinctly marked.

Length 49, height 27, diam. 20 mm." (von Ihering).

Type locality, Lagoa, Alagadinha, Goyaz, Brazil.

Diplodon hartwrighti von Ihering, Abh. Senck. Naturf. Ges., 32, 1910, p. 135, pl. 12, figs. 8*a-b*.

The following are unfigured and uncertain species.

Unio depressa d'Orbigny, Guer. Mag., 1835, p. 34.

Unio fokkesi Dunker, Zeits. für Mal., IX, 1853, p. 54.

Rio de la Plata, Brazil. According to von Ihering, this equals *U. wheatleyanus* Lea.

Unio koseretzi Clessin, Mal. Bl., X, p. 172.

River Guahyba, Brazil.

Unio macropterus Dunker, Zeits. für Mal., III, 1846, p. 109. Brazil.

Unio paraguayanus von Martens, S. B. Ges. Nat. Fr., 1895, p. 34.

Unio zealandicus Pætel, C. Sam., III, 1890, p. 172. Said to be of Gray. Where?

Unio damnoica d'Orbigny. Where?

Unio guahybæ von Ihering.

Unio æthiopiformis von Ihering.

Unio bischoffi von Ihering.

Unio sebastanæ von Ihering.

Unio sancta-paulæ von Ihering.

I do not know where the last five species are described, and they probably have never been published.

Family MUTELIDÆ.

Shell usually without sculpture throughout; beaks smooth or but faintly corrugated, never exhibiting the remains of an embryonic shell; with or without teeth, which, when present, are irregularly taxodont, the shell showing vestiges of them in all the genera; nacre soft, richly tinted, generally surrounded with a wide, prismatic border; escutcheon large, distinct; pallial line usually simple, but sometimes having a slight sinus posteriorly.

Animal having the labial palpi large, rounded below, generally without free points, scarcely or not at all united posteriorly; anal and superanal openings not separated; mantle generally closed behind into branchial and anal siphons, which are always separated by a strong bridge; marsupium occupying the inner gills; embryo a lasidium, composed of three segments, the anterior head-like, the median bearing a single shell, the posterior tail-like.

Genus SPATHA Lea, 1838.

Spatha Lea, Tr. Am. Phil. Soc., VI, 1838, p. 141, footnote.
Spathella Bourguignat, Esp. Ouk., 1885, p. 13.
Leptospatha Rochebrune and Germain, Mem. Soc. Zool. Fr., XVII, 1904, p. 25.

Shell elliptical; beaks very slightly or not at all sculptured; left valve having a faint, compressed tooth under and in front of the beak, which fits into a corresponding depression in the right valve; the entire hinge area often covered with longitudinally folded epidermal matter; escutcheon dark, sharply triangular; beak cavities shallow, with a single, elongate, deep scar in each; two large anterior muscle scars and two posterior ones, the upper small.

Animal having the palpi longer than wide, semicircular, attached along the upper edge, not united; mantle margin united behind so that the branchial and anal apertures are closed; on the under margin the mantle is entirely open; outer branchiæ united to the mantle to their extremity; inner the larger, free from the abdominal sac; foot tongue-shaped, thick; anal and branchial openings separated by a strong bridge. *S. rubens* Lamarck (Troschel).

Type, *Anodonta rubens* Lamarck.

So far as is known, this entire group is confined to Africa. I have placed the species in two subgenera, *Spatha* typical, including those forms with smooth or concentrically sculptured shells and *Aspatharia* of Bourguignat with broken, corrugated sculpture. I know nothing of the soft parts of the latter group, but the shells have the same general arrangement of muscle scars as the true Spathas. In placing species in the two groups of the typical subgenus, it is possible that some errors may have been made, as the groups are founded on the beak sculpture, which is often entirely eroded away. Unfortunately, as with the African *Unionidæ*, there are a large number of species that the writer has not seen. I have, therefore, followed very largely the excellent work of Germain, who has had the advantage of access to many of the original types and the large amount of material collected by the recent French expeditions.

Subgenus SPATHA s. s.

Shell solid, having faint, concentric beak sculpture.

Type, *Anodonta rubens* Lamarck.

Group of *Spatha rubens*.

Sculpture of the beaks following the growth lines; shell solid.

SPATHA RUBENS (Lamarck).

Shell large, elliptical or elliptic rhomboid, usually solid, convex to subinflated, inequilateral; beaks moderately full, somewhat elevated, nearly smooth or having a few, faint, concentric ridges; posterior ridge low, rounded; anterior end rounded; dorsal outline curved; base straight or curved; posterior end usually obliquely subtruncate above, ending in a blunt point below the median line; surface irregularly, concentrically striate or sulcate; epidermis coppery, tinted green on the earlier growth, shining; hinge with a vestigial, curved, compressed tooth in the left valve a little in front of the beak and a corresponding depression in the right valve, which is covered with epidermal matter; muscle scars impressed; there are two large ones in the anterior end of each valve and one in each posterior end; one large deep dorsal scar in each valve at or behind the beak; nacre generally coppery, iridescent.

Length 140, height 87, diam. 45 mm.
Length 114, height 74, diam. 40 mm.
Length 107, height 68, diam. 40 mm.
Length 130, height 75, diam. 40 mm.

Nile; Niger; Senegal; other points in West Africa.

Anodonta rubens Lamarck, An. sans. Vert., VI, 1819, p. 85.—Cailliaud, Voy. à Méroé, IV, p. 262; Atlas II, 1826, pl. lx, fig. 12.—Audouin, Savigny's Exp. de l'Egypte, Coquilles, 1827, pl. vii.—Deshayes, Enc. Meth., II, 1827, p. 147, pl. cci, figs. 1, 1*b*.

Iridina rubens Rang, Nouv. Ann. Mus., 1835, p. 314.

Platiris (Spatha) rubens Lea, Syn., 1838, p. 33; 1852, p. 55; 1870, p. 89.

Spatha rubens Clessin, Conch. Cab. Ano., 1853, pl. vii, fig. 1; 1876, p. 185, pl. lxi, fig. 1.—H. and A. Adams, Gen. Rec. Moll., II, 1857, p. 507.; III, pl. cxix, figs. 3, 3*a*.—Chenu, Man., 1859, II, p. 148, fig. 729.—Simpson, Syn., 1900, p. 896.

Anodon rubens Sowerby, Conch. Icon., XVII, 1867, pl. ii, fig. 5.

Anodonta clappertoni Kœnig, Duchane and Clapperton's Travels, 1826.

Anodonta splendens De Cristofori, Crist. and Jan. Cat., 1832(?).

Iridina solida Anton, Verz. der Conch., 1839, p. 16.

Anodonta solida Kuster, Conch. Cab. Ano., 1853, p. 50, pl. xii, fig. 1.

Spatha wissmani von Martens, S. B. Nat. Fr., 1883, p. 73; Conch. Mitth., III, 1885 (?), p. 139, pl. xxvii.

Spatha rubens var. *wismanni* Germain, Bull. Mus. Hist. Nat., 1907, p. 351; Arch. Zool. Exp. et Gen., (5), I, 1909, p. 55.

Spatha rotundata VON MARTENS, Besch., 1897, p. 242, fig. *d*.
Spatha rubens var. *rotundata* GERMAIN, Arch. Zool. Exp. et Gen., (5), I, 1909, p. 55.

The above measurements will show that this species is quite variable in size and form, as all of them are from adult specimens. There is much variation in the color of the nacre, which in some shells is quite dark, while it is light in others. A young specimen 70 millimeters long, which came with other shells in the National Museum from the Nile, has bluish-white nacre with scarcely a tint of purple.

Germain, (l. c.), considers von Martens' *wissmani* and *rotundata* entitled to varietal rank.

Var. *cailliaudi* von Martens.

Shell long elliptical or long subrhomboid, subsolid or solid; epidermis brownish-red, duller than in the type; nacre rose-colored or white.

Length 149, height 94, diam. 49 mm.
Length 142, height 87, diam. 49 mm.
Length 97, height 58, diam. 33 mm.

Anodonta rubens AUDOUIN in SAVIGNY, Icon. Moll. Eg., 1827, pl. VII, fig. 1.
Spatha cailliaudi VON MARTENS, Mal. Bl., XIII, 1866, p. 9.—JICKELI, L. and S. W. Moll., 1874, p. 259, pl. VIII, fig. 1.—KOBELT, Icon., new ed., II, 1886, p. 27, pl. XLVI, fig. 267.
Spatha rubens var. *cailliaudi* SIMPSON, Syn., 1900, p. 896.

I have before me a fine specimen of this, said to come from Alexandria, Egypt, which agrees with the description and with Jickeli's figure. I am inclined to believe it a mere variety of *S. rubens*, because I have seen shells of that species with the brown, somewhat roughened epidermis and dark coppery nacre and the young shell previously mentioned with the polished epidermis and whitish nacre.

Var. *chudeaui* Germain.

"Shell large, subtrapezoidal, slightly elongate, valves quite inflated, very thick and heavy; dorsal margin convex, slightly ascending; ventral margin slightly sinuous, meeting the dorsal margin at a decided angle; anterior region very short, rounded; antero-dorsal angle strongly projecting; posterior region well developed, slightly subtruncate, a little more than twice as long as the anterior; dorsal ridge very obtuse; beaks well anterior, not prominent, much eroded; ligament very strong; anterior muscular impressions very deep; posterior deep; pallial medium. Epidermis very deep brown, almost black; lines of growth strong and irregular, more feeble anteriorly; nacre bright rose-salmon, very iridescent.

Length 126, height 86, at the beaks 52, diam. 54 mm." (Germain).

Type locality, Le Mamoun, Senoussi Country and Le Gribingui.

Spatha rubens chudeaui GERMAIN, Bull. Mus. Hist. Nat., 1907, p. 65; l'Afrique Cent. Fr., 1907, p. 552, fig. 91.

"This magnificent variety is distinguished from the typical form by the very anterior position of the beaks; by the greater development of the posterior region, which terminates in a regularly rounded extremity; by the greatest height being more distant from the beaks; finally by the very divergent dorsal and ventral margins. In this last character, this variety recalls the appearance of *Spatha kirki* Ancey. In both of these shells, the dorsal margin is similarly very regularly convex from the postero-dorsal angle to the ventral margin."

SPATHA RENEI Jousseaume.

"Shell solid, depressed, equivalve, inequilateral, rounded in front, broader, compressed and subrotund behind, lines of growth irregularly concentric, epidermis olivaceous-black; umbones not prominent, eroded, placed at 1-3 of the length; dorsal margin curved; ventral rounded; hinge sinuous, edentulous; nacre iridescent, flesh-colored, violaceous under the beaks.

Length 81, height 56, diam. 25 mm." (Jousseaume).

Type locality, The Niger at Bamakou and Kougaba.

Spatha renei JOUSSEAUME, Bull. Soc. Zool. Fr., XI, 1886, p. 22, pl. XIII, figs. 3, 3*a*.—GERMAIN, l'Afrique Cent. Fr., 1907, p. 553.

Spatha rubens cailliaudi (part), Simpson, Syn., 1900, p. 896.

Germain, (l. c.), considers this a valid species, which differs "very distinctly" from *S. rubens*. In deference to his opinion, I have copied the original description.

Spatha bellamyi Jousseaume.

"Shell solid, heavy, black, oblong oval, depressed, equivalve, inequilateral, distantly and concentrically striate; depressed and rounded in front, depressed and acuminate behind; umbones not prominent, eroded; dorsal margin curved, gibbous; ventral rather rounded, constricted in the middle; hinge sinuous, edentulous; nacre pearly-while.

Length 110, height 77, diam. 33 mm." (Jousseaume).

Type locality, The Niger at Koulikono.

Spatha bellamyi Jousseaume, Bull. Soc. Zool. Fr., XI, 1886, p. 491, pl. XIII, fig. 2, *2a*.—Germain, Arch. Zool. Exp. et Gen., (5), I, 1909, p. 55.

Spatha rubens cailliaudi (part), Simpson, Syn., 1900, p. 896.

Germain, (l. c.), having accorded specific rank to this form, I repeat the original description.

Spatha corneola Rochebrune.

"Shell subtetragonal, solid, broadly rounded in front, subdilated and slightly sinuous behind, deeply, concentrically sulcate, sulci becoming lamellose and unequal at the extremities; dorsal margin slightly incurved; ventral margin concave; umbones not prominent, deeply eroded, coppery; epidermis brown, corneous, shining; nacre pale red, livid, with a marginal band iridescent with rose and blue.

Length 96, height in front 42, in the centre 51, behind 50, diam. 36 mm." (Rochebrune).

Type locality, Mokaka, Congo.

Spatha corneola Rochebrune, Bull. Soc. Mal. Fr., III, 1886, p. 9.—Simpson, Syn., 1900, p. 902.

Spatha ganciniensis Rochebrune, Bull. Soc. Mal. Fr., III, 1886, p. 9.—Germain, Arch. Zool. Exp. and Gen., (5), I, 1909, p. 55.

Spatha gancinenis Simpson, Syn., 1900, p. 902.

Germain, (l. c.), unites these two forms under the name of *ganciniensis*, but *corneola* has precedence.

SPATHA LEPSII Jickeli.

Shell subrhomboid, scarcely inflated, somewhat inequilateral, subsolid; beaks but little elevated, sculptured with well-marked concentric striæ, which extend over the whole shell; posterior ridge low, rounded; anterior end rounded, subangulate above, a little narrower than the posterior end; dorsal and ventral lines nearly straight; posterior end obliquely truncate above, rounded below the middle; epidermis fuscous-olive; hinge calloused, edentulous; nacre white or rose-colored, pearly.

Length 98, height 64, diam. 33 mm.

Upper Egypt; Senegal.

Spatha lepsii JICKELI, Faun. L. and S. W. Moll., 1874, p. 265, pl. IX, fig. 4.—SIMPSON, Syn., 1900, p. 896.

Spatha rubens var. *lepsii* GERMAIN, Arch. Zool. Exp. et Gen., (5), I, 1909, p. 55.

Exceedingly close to *S. chaiziana*, from which it differs in being a little more elongated, more strongly sculptured, less brilliant and more obliquely truncated behind. I think it quite probable that a good series would show absolute connection between them.

SPATHA CHAIZIANA (Rang).

Shell rather short, subrhomboid, subinflated, slightly inequilateral, subsolid; beaks somewhat prominent; posterior ridge moderately full, rounded; dorsal outline lightly arched, straight or incurved a little in front of the beaks; base straight or incurved in the middle, full behind the middle; anterior end narrowed, rounded, angled above; posterior end almost squarely subtruncate behind, rounded below; surface feebly, concentrically sculptured, almost smooth and shining except at the ends; color rich reddish-brown, ashy-tinted at the umbonal region; muscle scars shallow; dorsal scars narrow, not deep; nacre coppery or salmon-tinted, rich and brilliant, having a metallic lustre.

Length 82, height 56, diam. 33 mm.

Senegal; Niger; Upper Nile; West Africa.

Anodonta chaiziana RANG, Mem. Aceph. Senegal, (Nouv. Arch. Mus.), 1835, p. 13, pl. XXVIII.

Margarita (Anodonta) chaiziana LEA, Syn., 1838, p. 30.

Anodon chaiziana CATLOW and REEVE, Conch. Nom., 1845, p. 66.

Margaron (Anodonta) chaiziana LEA, Syn., 1852, p. 49; 1870, p. 79.

Spatha chaiziana CLESSIN, Conch. Cab. Ano., 1876, p. 187, pl. LXIII, figs. 3, 4.—SIMPSON, Syn., 1900, p. 896.

A fine specimen from the Morelet collection from Dr. Welwitsch bearing the above name is before me and from it the above description was drawn. Its comparative smoothness, and richer color distinguish it from *S. lepsii,* if these characters are constant. There are no teeth in the shell I have described.

SPATHA TAWAI Rang.

Type locality, Senegal.

Anodonta tawai RANG, Nouv. Ann. Mus., 1834, p. 14.

Anodonta tawi SIMPSON, Syn., 1900, p. 902.

Spatha tawai GERMAIN, l'Afrique Cent. Fr., 1907, p. 555; Arch. Zool. Exp. et Gen., (5), I, 1909, p. 56.

The original description is not accessible to me at the present time. Germain, (l. c., 1907), remarks: "The *Spatha tawai,* according to the types in the Museum of Paris, is a shell which differs from *Spatha chaiziana* only by its much smaller and noticably more compressed form and by its clearer epidermis, which is a magnificent, very brilliant green. It is extremely probable that the two species are synonymous and that *S. tawai* is only the immature form of *S. chaiziana.*"

SPATHA INNESI Pallary.

"The *Spatha cailliaudi* von Martens is a large species, which has been well figured by Cailliaud (Atlas II, pl. 60, fig. 12), under the name of *Anodonta rubens* and by Jickeli, pl. VIII, fig. 1.

The name of *Anodonta rubens* was applied by Lamarck to a form from Senegal, different from the Egyptian species and for this reason M. von Martens gave to the species figured by Cailliaud the name of that traveller. We have not found in the collections of Dr. Innes Bey this remarkable species; all the specimens of *Spatha* sent to us belong to a form much smaller and proportionally more inflated and with thicker valves. This form was certainly referred to *Spatha cailliaudi* by Jickeli, for he cites (p. 260) specimens corresponding in dimensions to ours.

Our species is quite near to *Spatha chaiziana* Rang of southern Africa, but differs by its thicker and more inflated shell, its somewhat more rostrate form and finally in general appearance. It differs equally from *Spatha arcuata* Cailliaud (loc. cit., pl. 61, fig. 5) by its smaller size and straight, not depressed, posterior extremity.

The *Spatha innesi*, like all the species of the genus, has the nacre of a beautiful deep rose-color.

Length 60, height 37, diam. 25 mm." (Pallary).

Type locality, The Upper Nile.

Spatha innesi Pallary, Bull. Inst. Egypt, III, 1903, p. 97, pl. II, fig. 2.

"This species in its external appearance quite resembles *Chambardia locardi* Bgt. But the Chambardias are "characterized by the right valve being decidedly less strong, smaller and notably less inflated than the left valve, especially in the umbonal region," this is not the case in the *Spatha innesi*."

Spatha tristis Jousseaume.

Shell oblong, scarcely subinflated, subsolid, inequilateral; beaks slightly prominent; posterior ridge rounded, ending in a blunt point a little below the median line; dorsal margin lightly arched; base nearly straight; anterior end a little narrower than the posterior end, rounded, sometimes subangulate above; dorsal slope obliquely truncate; surface having irregular growth lines and traces of radial sculpture; epidermis blackish, subshining; anterior scars elongated, impressed; posterior scars shallow, elliptical; nacre lurid but shining, having shades of yellowish-gray and green.

Length 65, height 37, diam. 22.5 mm.

Upper Senegal.

Spatha tristis JOUSSEAUME, Bull. Soc. Zool. Fr., XI, 1886, p. 497.—SIMPSON, Syn., 1900, p. 897.

Spatha rochebrunei JOUSSEAUME, Bull. Soc. Zool. Fr., XI, 1886, p. 494, pl. XIV, figs. 1, 1*a*.—GERMAIN, Arch. Zool. Exp. et Gen., (5), I, 1909, p. 56.

A rather small species with a dark, somewhat lurid, subshining surface, the epidermis showing traces of radial and feather-like wrinkling. The nacre is a peculiar combination of tints, and though lurid, is shining.

Germain, (l. c.), refers *S. rochebrunei* Jouss. to *chaiziana* Rang as a synonym.

SPATHA TRAPEZIA von Martens.

Shell somewhat irregularly obovate, inflated, solid; somewhat inequilateral; beaks scarcely elevated; posterior ridge rather full, narrowly rounded, curved, ending a little below the median line in a blunt point; dorsal outline curved; anterior end rounded, slightly narrowed; base curved and fuller behind the middle; posterior end obliquely subtruncate above; surface nearly smooth; epidermis greenish, brownish posteriorly; nacre bluish-white.

Length 70, height 39, diam. 22 mm.

Length 66, height 35.5, diam. 26 mm.

Lake Victoria Nyanza.

Spatha trapezia VON MARTENS, Besch., 1897, p. 243, fig.—SIMPSON, Syn., 1900, p. 879.

Solider and more obovate than *S. tristis*, having a somewhat elevated, curved posterior ridge. It is more produced behind the middle of the base than that species and has a bluish-white nacre.

Var. *senilis* von Martens.

The variety *senilis* seems like a stunted form of the above. The posterior point is somewhat drawn down and the shell is smaller than the type.

Length 58, height 33, diam. 20 mm.

Spatha trapezia var. *senilis* VON MARTENS, Besch., 1897, p. 244.—SIMPSON, Syn., 1900, p. 879.

SPATHA DROUETI Chaper.

Shell somewhat elongated, trapezoidal, subinflated, subsolid, inequilateral, beaks pointed but not high; posterior ridge rounded, ending in a blunt point near the base of the shell; anterior end narrowed, rounded; dorsal outline curved; base a little incurved medially; dorsal slope obliquely truncate; surface lightly, concentrically striate; epidermis brownish or blackish, slightly wrinkled and showing traces of radial sculpture; hinge edentulous; muscle scars shallow; nacre lurid greenish, somewhat iridescent.

Length 69, height 37, diam. 24 mm.

Assinie, Africa.

Spatha droucti CHAPER, Bull. Soc. Zool. Fr., X, 1885, p. 43, pl. 1, figs. 1-3.—SIMPSON, Syn., 1900, p. 897.

A rather small species, of which two specimens from the author are before me. It is considerably wider behind than in front; the base is incurved medially and full behind the middle; the dark, subshining surface shows faint retriculation.

SPATHA MARTENSI Sturany.

"Shell large, ventral margin slightly incurved, posterior margin obliquely descending and thus forming a beak, of which the point is nearly on the line of the ventral margin. Epidermis dark brown; nacre slightly rose-red.

Length 137, height 77, diam. 21 mm. Beaks situated at nearly 2-7 of the length." (von Martens).

Type locality, stream falling into Lake Victoria Nyanza.

Spatha martensi STURANY in Baumann, Durch Massai, 1894, p. 12, pl. XXV, fig. 39.—VON MARTENS, Besch., 1897, p. 244. —SIMPSON, Syn., 1900, p. 897.

Spatha cailliaudi var. *martensi* GERMAIN, Arch. Zool. Exp. et Gen., (5), I, 1909, p. 55.

The original description not being accessible, I have copied that of von Martens, who remarks that "it appears to differ from *S. cailliaudi* only in the lower position of the beak."

Germain, (l. c.), considers it to be only a variety of *cailliaudi*.

Spatha kirki (Ancey).

Shell subtrapezoid, subinflated, inequilateral, narrowed in front, gradually increasing in height to the hinder end of the ligament; beaks apparently moderately elevated; anterior end rounded; base full behind the middle; dorsal slope raised into a low wing and roundly and obliquely subtruncate behind; posterior ridge well developed, subangulate, curved, ending in a point at the base of the shell; surface lightly, concentrically sculptured, greenish-brown or blackish-brown; nacre reddish or whitish.

Length 90, height 55, diam. 29.5 mm.

Shire River and Lake Nyanza.

Spathella kirki Ancey, Bull. Soc. Zool. Fr., VII, 1894, p. 229, figs. 4-6.

Spatha kirki Simpson, Syn., 1900, p. 897.

This species is decidedly trapezoid in general outline, much narrowed in front, and high, almost winged on the post-dorsal region. The posterior end is obliquely curved.

Var. *liederi* von Martens.

Somewhat more elongated than the type, the height to length is as 1 to 2; the anterior dorsal edge falls off less quickly and the posterior edge raises less. Nacre rose-red.

Length 110, height 61, diam. 32 mm.

Spatha kirki var. *liederi* von Martens, Besch., 1897, p. 245.—Simpson, Syn., 1900, p. 897.

Spatha mabillei Jousseaume.

Shell oblong, widest behind, subsolid, inequilateral, scarcely inflated; beaks somewhat elevated; anterior end narrowed and rounded; posterior end considerably wider, obliquely subtruncate above, rounded below; dorsal line curved; base incurved medially, full behind the middle; surface with irregular growth lines, having radial markings on the anterior half; epidermis blackish; nacre brilliant blue, tinted green; anterior scars deep, the larger placed near the border and is oval in outline.

Length 52, height 29, diam. 20 mm.

Type locality, Senegal River.

Spatha mabillei JOUSSEAUME, Bull. Soc. Zool. de Fr., XI, 1886, p. 495, pl. XIV, figs. 2, *2a*.—SIMPSON, Syn., 1900, p. 879.—GERMAIN, l'Afrique Cent. Fr., 1907, p. 555.

This is exceedingly close to *S. droueti* and may be merely a form of that. It seems to be higher in proportion to length, to have more brilliant nacre and deeper anterior scars.

Germain, (l. c.), says: "This species is certainly very close to *Spatha chaiziana*, but is to be distinguished by its more compressed form and less developed and more widely rounded posterior region."

Var. *mamounensis* Germain.

"Shell subrectangular, compressed; valves moderately thick, solid; dorsal margin nearly straight, slightly ascending; ventral margin straight, nearly parallel to the dorsal margin; anterior region moderately developed, semi-circular; posterior region sub-oval, scarcely twice as long as the anterior; beaks very slightly projecting; ligament 14.5 mm. long; anterior muscular impressions moderate, posterior feeble. Epidermis deep chestnut, almost black, very brilliant; lines of growth moderate and irregular; nacre violaceous, quite iridescent.

Length 61, height 40.5, at beaks 20.5, diam. 23 mm." (Germain).

Type locality, Le Mamoun, Senoussi Country.

Spatha mabillei var. *mamounensis* GERMAIN, Bull. Mus. Hist. Nat., 1907, p. 67; l'Afrique Cent. Fr., 1907, p. 556, fig. 92.

"Compared with the type, the variety *mamounensis* is distinguished by its less elongated form; by its posterior region much less elongated with the margin more regularly convex; by its straight dorsal margin, nearly parallel to the ventral margin; by its shorter ligament; etc."

SPATHA ADANSONI (Jousseaume).

Shell elongated, subrhomboid, somewhat inflated, thin, inequilateral; beaks moderately full; posterior ridge rounded, ending in a point at a little distance above the base; dorsal and basal lines almost straight and parallel; anterior end rounded; dorsal slope obliquely subtruncate; surface strongly concentrically sculptured; epidermis fuscous, with a yellowish border; nacre pearly, rose-colored.

Length 92, height 49, diam. 27 mm.

Upper Senegal.

Spathella adansoni JOUSSEAUME, Bull. Soc. Zool. Fr., XI, 1886, p. 498, pl. XIV, figs. 4, 4*a*.

Spatha adansoni SIMPSON, Syn., 1900, p. 898.

Very close to and perhaps equal to *S. wahlbergi*. It is more strongly, concentrically sculptured and rather more rhomboid according to the figure than any of the specimens of that species that I have seen and it is a little more inflated.

SPATHA WAHLBERGI (Krauss).

Shell elongate elliptical, convex, subsolid, inequilateral; beaks slightly prominent, with very delicate, concentric sculpture; dorsal and ventral outlines nearly straight and parallel; anterior end rounded; posterior end rounded, but slightly inclined to be pointed at or below the median line; surface delicately and irregularly concentrically striate; epidermis reddish-brown, sometimes greenish-tinted; anterior scars impressed, the principal one situated close to the edge of the shell and elongated; dorsal scar shallow; nacre varying from purplish to coppery.

Length 90, height 45, diam. 23 mm.

Length 110, height 55, diam. 31 mm.

Tropical and Southern Africa.

Iridina wahlbergi KRAUSS, Sud Af. Moll., 1848, p. 19, pl. II, fig. 1.

Platiris (Spatha) wahlbergi LEA, Syn., 1852, p. 55; 1870, p. 89.

Spatha wahlbergi CLESSIN, Conch. Cab. Ano., 1876, p. 187, pl. LXIII, fig. 1.—SIMPSON, Syn., 1900, p. 898.

Mutela wahlbergi SMITH, Ann. and Mag., VIII, 1891, p. 319.

Spatha natalensis LEA, Pr. Ac. N. Sci. Phila., VIII, 1864, p. 113; Jl. Ac. N. Sci. Phila., VI, 1866, p. 64, pl. XX, fig. 58; Obs., XI, 1867, p. 68, pl. XX, fig. 58.—CLESSIN, Conch. Cab. Ano., 1876, p. 189, pl. LXII, figs. 7, 8.

Platiris (Spatha) natalensis LEA, Syn., 1870, p. 89.

Several shells are before me, which I refer to the above species, among them Lea's *natalensis*.

Var. *hartmanni* von Martens.

The concentric sculpture is well developed and over most of the surface very fine radiating striæ are seen. The epidermis is olive-green.

Length 94, height 45.5, diam. 26.5 mm.

Tropical and southern Africa.

Spatha hartmanni VON MARTENS, Mal. Bl., XIII, 1866, p. 10.—JICKELI, Faun., 1874, p. 263, pl. VIII, fig. 2.—CLESSIN, Conch. Cab. Anc., 1875, p. 190, pl. LXI, figs. 2, 3.—GERMAIN, Arch. Zool. Exp. et Gen., (5), 1909, p. 56.

Anodon tabula SOWERBY, Conch. Icon., XVII, 1867, pl. XVIII, fig. 68.

Anodonta tabula PÆTEL, Conch. Sam., III, 1890, p. 185.

Spatha wahlbergi (part), SIMPSON, Syn., 1900, p. 898.

There is a large shell in the National Museum collection without locality that I refer to this variety of *wahlbergi*. The description and figure of *S. hartmanni* agree with that of *wahlbergi* except in the degree of development of the sculpture. The shell above mentioned is 131 millimeters in length, 68 in height and 34 in diameter.

Gemain, (l. c.), considers this a valid species.

Var. *bourguignati* Bourguignat.

Height almost or quite one-half the length, the posterior part of the hinge line slightly elevated, and angled where it joins the obliquely truncate dorsal slope; base straight or slightly incurved medially.

Lake Nyassa.

Spatha bourguignati BOURGUIGNAT, Esp. Ouk. et Tan., 1885, p. 12.—GERMAIN, l'Afrique Cent. Fr., 1907, p. 560.

Spathella bourguignati BOURGUIGNAT, Moll. Af. Eq., 1889, p. 197, pl. VIII, fig. 1.

Spatha wahlbergi var. *bourguignati* SIMPSON, Syn., 1900, p. 898.

Spathella spathuliformis Bourguignat, Moll. Af. Eq., 1889, p. 199, fig.

Spatha wahlbergi spatuliformis von Martens, Beschalte, 1897, p. 248, pl. vii, fig. 18.

Leptospatha spathuliformis Rochebrune and Germain, Mem. Exp. et Gen., (5), I, 1909, p. 57.

Spatha (Leptospatha) spathuliformis Germain, Arch. Zool. Exp. et Gen., (5), 1909, p. 57.

Spathella bloyeti Bourguignat, Moll. Af. Eq., 1889, p. 198, pl. viii, fig. 3.

Spatha bloyeti von Martens, Besch., 1897, p. 249.

Germain, (l. c.), considers this form entitled to specific rank, and (l. c., 1909), distinguishes *spathuliformis* specifically from *bourguignati*.

Var. *dorsalis* von Martens.

"The beaks are further forward, being situated at 2-7 to 1-4 of the length, consequently the posterior margin is longer; the distance from the beaks to the end of the hinge is nearly or in some examples quite equal to one-half of the length of the entire shell. Impressions of the umbonal muscles only slightly lengthened.

Length 136, height 67, diam. 41 mm.

Length 127, height 63.5, diam. 33 mm.

Length 85, height 42, diam. 21 mm." (von Martens).

Type locality, Ilindi and Myesse, both in Ugogo and the Zambezi River.

Spatha wahlbergi var. *dorsalis* von Martens, Besch., 1897, p. 247.—Germain, Arch. Zool. Exp. et Gen., (5), I, 1909, p. 56.

As Germain, (l. c.), considers this form worthy of varietal rank, I give the original description.

Spatha bozasi (Rochebrune and Germain).

"Shell transversely elongate oblong, inequilateral, subsolid, pale olivaceous-brown, with regular lines of growth, which become lamellose below; umbones minute, slightly eroded, contiguous; dorsal margin somewhat curved; ventral margin almost straight, quite deeply incurved in the middle; anterior margin elongate, rounded; posterior margin produced in a long, subacute beak; ligament long; anterior muscular impression deeply impressed, long elliptical; posterior ovate, lacrimæform; nacre pale rose-color, bluish on the margin and shining.

Length 85, height 38, diam. 24 mm." (R. and G.)

Type locality, Lake Rodolphe.

Spathella bozasi ROCHEBRUNE and GERMAIN, Bull. Mus. Hist. Nat., 1904, p. 144.

Leptospatha bozasi ROCHEBRUNE and GERMAIN, Mem. Soc. Zool. Fr., XVII, 1904, p. 26, pl. II, fig. 7.

"It is to *Spathella bloyeti* Bgt., that this form appears to approach the nearest; it differs, however, by its markedly greater elongation, by the more produced anterior region, by the more pronounced median curve of the ventral margin, by the longer curve of the dorsal margin, by the much longer, brown, less prominent ligament and, finally, by the different color."

SPATHA BRUMPTI (Rochebrune and Germain).

"Shell oblong ovate, compressed, inequilateral, solid, rather heavy, yellowish-brown, shining; lines of growth broad, distant, in front and, especially behind, broadly laminose; umbones eroded, rather prominent, subinflexed, contiguous; dorsal margin almost straight; ventral convex, slightly undulated; anterior end ovate; posterior end dilated, produced in a subcompressed, and slightly decurved beak; ligament long and rather prominent; anterior muscular impression biplex, trapezoidal, the anterior alone deeply impressed; posterior subquadrate; within dirty rose-color, cretaceous, scarcely shining.

Length 80, height 42, diam. 25 mm." (R. and G.)

Type locality, The Omo, opposite the Makoua Mountains.

Spathella brumpti ROCHEBRUNE and GERMAIN, Bull. Mus. Hist. Nat., 1904, p. 144.

Leptospatha brumpti ROCHEBRUNE and GERMAIN, Mem. Soc. Zool. Fr., XVII, p. 26, pl. II, fig. 6.

"This form approaches the *Spathella bourguignati* Ancey, but differs in its less elongated shape, the anterior margin is oval and not elliptical, the posterior end is wider and much less rostrated, the ventral margin is decidedly convex and not oval elliptical, the beaks are more prominent and, finally, by its larger size."

SPATHA MAITENGUENSIS Sturany.

"Shell elongate, quite regularly oval, dark brown with faint olive-green bands. The dorsal margin of the right valve extends above the left principally in the umbonal region and anteriorly. The ventral margin is nearly straight, being only very slightly incurved in the middle, the posterior portion horizontal, scarcely ascending; posterior extremity rounded. The length of the shell is to the diameter as 2:1; the beaks are situated in the first fourth of the length.

Length 88, height 46, diam. 25 mm., the anterior end is 20 mm. long." (Sturany).

Type locality, Maitengue River, Matabele Land.

Spatha maitenguensis STURANY, Denk. Ak. Wien LXVII, 1898, p. 628, pl. III, fig. 66.

"This new form is indeed closely related to *Spatha wahlbergi* var. *dorsalis* and *Sp. wahlbergi* var. *spatuliformis,* but cannot be united to either and even less to typical *Sp. wahlbergi.* In order not to bring confusion into the synonymy, I have provisionally separated it as a species."

SPATHA LACUSTRIS Simpson.

Shell long obovate, subsolid, convex, inequilateral; beaks small, somewhat sharp; posterior ridge rounded; dorsal line nearly straight; basal line lightly incurved in front of the middle, full behind; anterior end narrowed, rounded; posterior end rounded, slightly produced in the middle; post-dorsal region lightly winged, angular behind the ligament; epidermis fuscous chestnut, pale at the beaks, dark and intensely colored on the dorsal slope, where it is somewhat waxy and shining; nacre pale rose.

Length 98, height 52 mm.

Lake Nyassa.

Spatha anceyi Bourguignat, Mem. Soc. Zool. Fr., VII, 1894, p. 231, fig. 7.

Spatha lacustris Simpson, Syn., 1900, p. 898.—Germain, l'Afrique Cent. Fr., 1907, p. 564; Arch. Zool. Exp. et Gen., (5), I, 1909, p. 57.

Appears to be close to *S. kirki,* but is more elongated and not so pointed behind. It is rather wider in front than that species. Changed from *S. anceyi,* as there is another species with that name.

Germain, (l. c.), considers this to be a form of *S. bourguignati.*

Spatha nyassaensis Lea.

Shell obovate, compressed, rather solid, inequilateral; beaks low, pointed with faint, broken, concentric sculpture; posterior ridge low, narrowly rounded, ending below the median line; anterior end narrowed, rounded; dorsal and basal lines lightly curved, the latter full behind the middle; posterior slope obliquely subtruncate; surface with low, irregular, concentric sculpture; epidermis dark tawny; nacre flesh-colored; muscle scars impressed.

Length 53, height 31, diam. 13.5 mm.

Lake Nyassa.

Spatha nyassaensis Lea, Pr. Ac. N. Sci. Phila., VIII, 1864, p. 109; Jl. Ac. N. Sci. Phila., VI, 1866, p. 36, pl. xiii, fig. 33; Ob., XI, 1867, p. 40, pl. xiii, fig. 33.—?Clessin, Conch. Cab. Ano., 1876, p. 190, pl. lxii, figs. 3, 4.—Simpson, Syn., 1900, p. 898.

Platiris (Spatha) nyassaensis Lea, Syn., 1870, p. 89.

Spathella nyassaensis Ancey, Bull. Soc. Zool. Fr., VI, 1894, p. 228.

Spatha nyassana Bourguignat, Bull. Soc. Mal. Fr., VI, 1889, p. 38.

I have before me the type and a young specimen of this species. Its compressed form and pale epidermis will distinguish it from related species.

SPATHA APPROXIMANS Preston.

"Shell closely allied to *S. nyassensis* Lea, (Proc. Zool. Soc. London, 1877, p. 719), but broader posteriorly, more acuminate, and covered with a periostracum much paler in color; the interior of the shell is exceedingly finely granulate.

Long. 64, lat. 100 mm." (Preston).

Type locality, Shiré River, at a point from 3 to 4 kilometres to the south of Lake Nyassa.

Spatha approximans PRESTON, Ann. Mag. Nat. Hist., (8), VI, p. 63, pl. V, fig. 14.

SPATHA MARNOI Jickeli.

Shell long obovate, convex, subsolid, inequilateral; beaks slightly elevated; dorsal outline arched from the anterior end to the posterior point, a little fuller behind the ligament; anterior end narrowed and rounded; base straight or lightly incurved medially, full behind the middle; posterior end rounded, somewhat developed just below the median line; surface evenly, concentrically sculptured; epidermis shining, yellowish-fuscous, with three curved, green rays on the dorsal slope; hinge lightly calloused; nacre pale rose, pearly.

Length 85, height 40.75, diam. 23.5 mm.

Marno, Abyssinia.

Spatha marnoi JICKELI, L. and S. Moll. N. Ost.-Af., 1874, p. 264, pl. VIII, fig. 3.—SIMPSON, Syn., 1900, p. 899.

Spatha marmoi GERMAIN, Arch. Zool. Exp. and Gen., (5), I, 1909, p. 55.

Approaches *S. nyassaensis*, but is larger, more elongated, more sharply sculptured, and has three green, rather broad rays on the posterior slope, which do not appear in either of Lea's shells.

SPATHA FOURTAUI (Pallary).

"In its external appearance this Naiad so closely resembles *Spatha marnoi* figured in Jickeli, pl. VIII, fig. 3, that at first we considered it to be a form *minor*, the more so as the hinge of that species has not been figured. But the description (p. 264) leaves no doubt in regard to the distinctness of the two species. Jickeli, indeed, says *"cardo leviter callosus, edentulus. Facies interns pallide rosea . . .,"* which applies well to a *Spatha.* Our species, on the contrary, has a filiform hinge and the interior of the valves is a grayish-blue, two characters, which belong only to the genus *Spathella.* Besides being smaller, the *S. fourtaui* differs also by its more slender form and slightly more angulated posterior margin." (Pallary).

No dimensions given. Length of figure 62.5, height 29.5 mm.

Type locality, Upper Nile.

Spathella fourtaui PALLARY, Bull. Inst. Egypt, III, 1903, p. 96, pl. 1, fig. 3.

SPATHA SUBÆQUILATERA von Martens.

Shell long elliptical, subcompressed, solid, almost equilateral, the full high beaks being placed a very little in front of the center and nodulously costate; dorsal and basal lines nearly straight; anterior end rounded; posterior end bluntly pointed on the median line; surface strongly, concentrically sculptured, olive-green; nacre pale bluish; muscle scars large and impressed.

Length 80, height 56, diam. 24 mm.

Lake Victoria Nyanza.

Spatha subæquilatera VON MARTENS, Conch. Mitt., III, 1887, p. 18, pl. XLI, figs. 8, 9; Besch., 1897, p. 246, pl. VII, fig. 16.—SIMPSON, Syn., 1900, p. 899.

Spatha baumanni STURANY in Baumann, Durch. Massai., 1894, p. 12, pl. XXV, fig. 38.

Remarkable for having the beaks placed almost in the center of the shell. It is a solid species with strong, concentric sculpture, bluish nacre, and large, well-impressed muscle scars. The shape is almost evenly long elliptical.

SPATHA SINUATA von Martens.

Shell somewhat elongated, subelliptical, a little wider behind, convex, inequilateral; beaks moderately full; posterior ridge rounded; dorsal line lightly curved; anterior end rounded; base decidedly incurved medially, full behind the middle;

posterior end rounded, but somewhat produced a little below the median line; surface apparently finely, concentrically sculptured: epidermis reddish-brown, subshining; muscle scars large, impressed, the two anterior ones confluent; nacre pale reddish.

Length 77, height 38, diam. 24 mm.

Congo.

Spatha sinuata VON MARTENS, S. B. Nat. Fr., 1883, p. 173; Conch. Mitt., II, 1885, p. 190, pl. XXXIV, figs. 5, 6.—SIMPSON, Syn., 1900, p. 899.

This species appears to differ from *S. mabillei* in its larger size, the color of its epidermis and nacre, and in being more elongated. von Martens' description is very brief and does not touch on all the characters, but the figures are clear and show a different style of anterior scars from any that I am acquainted with.

SPATHA BERTILLONIANA Preston.

"Shell moderately flat, rectangularly ovate, solid, scarcely angled posteriorly, covered with a fine, reddish-chestnut periostracum, sculptured with coarse, broad, somewhat distant, concentric growth-lines and very fine, transverse, radiate striæ; umbones small, not prominent; dorsal margin nearly straight, somewhat ascending; ventral margin constricted towards the middle; anterior side squarely rounded; posterior side broadly produced, bluntly acuminate; anterior adductor scars ovate, well impressed; posterior scars broadly ovate, moderately impressed; infra-umbonal visceral scars in right valve broad, in left valve small, short and deep; pallial margin coarsely defined; interior of shell nacreous, pinkish-white, iridescent, especially towards the posterior side, sculptured with fine, interlacing, irregular, wavy striæ converging towards the centre of the shell.

Long. 51.5, lat. 97 mm." (Preston).

Type locality, Karonga, north end of Lake Nyassa.

Spatha bertilloniana PRESTON, Ann. Mag. Nat. Hist., (8), VI, p. 63, pl. V, fig. 15.

"A very handsome species, of which the internal sculpture is most curious and may, in a measure, be compared to the markings of finger-prints; in the single specimen before me this remarkable sculpture is much more apparent in the right than in the left valve."

Group of *Spatha petersi.*

Shell rather thin and small, greenish or olive; beak sculpture consisting of faint, more or less oblique, parallel ridges; hinge line narrow; teeth scarcely developed; nacre bluish or greenish. Animal unknown.

SPATHA PETERSI von Martens.

Shell oblong, thin, subcompressed, inequilateral; beaks slightly elevated, somewhat pointed; posterior ridge full, rounded or slightly inclined to be biangulate, ending in a blunt point a little below the median line; dorsal and basal lines lightly curved, the latter full behind the middle; anterior end rounded; posterior end obliquely subtruncate above; surface lightly, concentrically sculptured; epidermis yellowish-green, sometimes feebly rayed on the dorsal slope; nacre bluish-white to lurid purple; muscle scars but slightly impressed.

Length 67, height 33, diam. 17 mm.

Length 65, height 32, diam. 19 mm.

Mozambique; Zanzibar and Uganda.

Spatha petersi VON MARTENS, Mal. Bl., VI, 1860, p. 218, pl. III, figs. 1, 2.—SIMPSON, Syn., 1900, p. 899.

Mutela petersi CLESSIN, Conch. Cab. Ano., 1875, p. 197, pl. LXII, figs. 1, 2.

Spathella petersi BOURGUIGNAT, Mol. Af. Eq., 1899, p. 197.

Spatha modesta LEA, Pr. Ac. N. Sci. Phila., VIII, 1864, p. 109; Jl. Ac. N. Sci. Phila., VI, 1866, p. 37, pl. XIII, fig. 35; Obs., XI, 1867, p. 41, pl. XIII, fig. 35.

Platiris (Spatha) modesta LEA, Syn., 1870, p. 89.

Two specimens of this are before me and they are in good condition save that the beaks are somewhat eroded. The shell is almost evenly long elliptical, slightly inclined to be rhomboid. It is a very little higher at the place where the base is full than in front. The substance is thin, the epidermis yellowish or tawny-green; nacre lurid purple. Lea's *modesta* is more slender than these shells and has a bluish nacre. von Martens' *S. petersi* as figured seems to stand between the two lots.

Spatha arcuata (Cailliaud).

Shell somewhat elongate, subrhomboid and arcuate, convex to subinflated, solid, inequilateral; beaks but slightly elevated, apparently having oblique sculpture; dorsal and posterior outlines curved, sometimes subangulate behind the ligament; anterior end rounded; base decidedly incurved; posterior ridge rounded; there are sometimes one or two low, radial ridges above it; surface with irregular, concentric striæ; epidermis dull, greenish or greenish-brown; left valve with a compressed rudimentary tooth, which fits into a corresponding depression in the right valve; muscle scars impressed; dorsal scars deep; nacre whitish or flesh-colored, pearly.

Length 82, height 47, diam. 34 mm.
Length 90, height 48, diam. 31 mm.
Length 80, height 38, diam. 24 mm.

Egypt; Abyssinia.

Anodonta arcuata Cailliaud, Voy. à Méroé, IV, 1826, p. 263; II, pl. LX, figs. 4, 5.—?Clessin, Conch. Cab. Ano., 1874, p. 145, pl. XLVII, figs. 1, 2.

Margarita (Anodonta) arcuata Lea, Syn., 1836, p. 54; 1838, p. 32.

Iridina arcuata Potiez and Michaud, Gall. Moll., 1844, p. 146, pl. LV, fig. 4.

Margaron (Anodonta) arcuata Lea, Syn., 1852, p. 53; 1870, p. 83.

Spatha arcuata Jickeli, L. and S. Moll. N. Ost-Af., 1874, p. 265.—Simpson, Syn., 1900, p. 899.

It will be seen by the above measurements that this species is quite variable in size. It has a heavy shell with a decidedly arcuate subrhomboid outline, greenish or greenish-brown epidermis and whitish or silvery nacre.

SPATHA CRYPTORADIATA Putzeys.

Shell oblong, rhomboid, inequilateral, convex with dorsal and ventral lines parallel, both curved up a little in the middle; posterior slope subtruncate; anterior end rounded; posterior ridge low, rounded, ending behind in a blunt point near the base of the shell; beaks somewhat raised, their sculpture not known; surface apparently concentrically ridged, having a few feeble plications on the posterior slope; epidermis fuscous; nacre pearly, bluish-white, rather thick.

Length 64, height 29, diam. 17 mm.

Leopoldville; Congo.

Spatha cryptoradiata PUTZEYS, Proc. Verb. Soc. Mal. Belg., 1898, pl. XXVII, figs. 14, 15.—SIMPSON, Syn., 1900, p. 900.—GERMAIN, l'Afrique Cent. Fr., 1907, p. 562.

Spatha (Leptospatha) cryptoraoita GERMAIN, Mem. Soc. Zool. Fr., XIX, 1906, p. 241.

According to the figure this species is sculptured with fine, broken plications, which run longitudinally or somewhat obliquely to the growth lines.

According to Germain, (l. c. 1907), this peculiar appearance of the epidermis is not a specific character, but is the result of the alternate conditions of drought and humidity to which the species is subjected in its habitat.

SPATHA PROTCHEI (Rochebrune).

"Shell elongate rhomboid, subcompressed, rounded in front, elongate wedge-shaped behind, slightly gaping; epidermis smooth, shining, sublamellose, especially in the posterior region; concentrically, minutely sulcate and radiately, broadly striate; dorsal margin nearly straight; ventral margin subsinuous; beaks small, eroded, copper-colored; epidermis brownish-red; nacre livid in the centre, pale rose towards the margins, shining.

Length 61, height, in front 22, in the middle 25, behind 28, diam. 14 mm." (Rochebrune).

Type locality, Mokaka, Congo.

Spathella protchei ROCHEBRUNE, Bull. Soc. Mal. Fr., III, 1886, p. 8.—SIMPSON, Syn., 1900, p. 902.

Spatha (Leptospatha) protchei GERMAIN, Bull. Mus. Hist. Nat., 1909, p. 543, pl. VIII, fig. 46.

Germain (l. c.), remarks that this species is related to *S. cryptoradiata* Putzeys, but differs, "by its more compressed, more regularly subquadrangular-elongated form; more central beaks and by the parallelism of the dorsal and ventral margins."

SPATHA STUHLMANNI von Martens.

Shell elongated, irregularly subrhomboid, solid, subinflated, inequilateral; beaks apparently but little elevated; posterior ridge prominent, widely rounded or feebly subangulate, ending in the base in a blunt, rounded point or feeble biangulation; dorsal outline arched; dorsal slope with a long, oblique truncation; anterior end rounded, narrowed a little; base nearly straight, full behind the middle; surface concentrically, irregularly sculptured; epidermis blackish; nacre whitish-gray.

Length 71, height 35, diam. 24 mm.

Length 60, height 30, diam. 24 mm.

Lake Albert; Nyanza.

Spatha stuhlmanni VON MARTENS, Besch., 1897, p. 250, fig.—SIMPSON, Syn., 1900, p. 900.

I have never seen this species, but from the figure and description I should think it was rather closely related to *S. arcuata*. It is not arcuate however, as that species is, the base line being slightly rounded and full behind the middle.

Var. *comoeensis* Germain.

"It seems to me to be impossible to separate this shell from von Martens' species, of which it possesses the principal characters, but from which it is easily distinguished: by its very noticably less elongated form, by its anterior end more regularly convex with a more prominent anterio-dorsal angle; finally by its more convex dorsal margin.

The shell is solid, brilliant, olive-green near the beaks, yellowish-brown below; the lines of growth are quite strong and irregular; finally the nacre is slightly salmon-tinted, very iridescent.

Length 62, of anterior region 23, of posterior region 41, height 36, at the beaks 14, diam. 24.5 mm." (Germain).

Type locality, Comoe River, near the Gold Coast.

Spatha stuhlmanni var. *comoeensis* GERMAIN, Bull. Mus. Hist. Nat., XIV, 1908, p. 127; Jl. de Con., LVI, 1908, p. 114, pl. III, fig. 12.

SPATHA DECORSEI Germain.

"Shell of medium size, elongate rectangular in shape; valves quite inflated, thick, heavy; dorsal margin almost straight, slightly ascending; ventral margin decidedly sinuous, parallel with the dorsal margin; anterior region rather short, rounded; posterior region much extended, a little more than twice as long as the anterior; dorsal ridge not strong, very obtuse; beaks obtuse, not compressed, scarcely prominent, much eroded, showing a lead-colored nacre; ligament short, quite strong, 18 mm. long; hinge filiform, edentulous; anterior muscular impressions very deep; posterior quite faint; pallial impression feeble. Epidermis a beautiful deep brown, passing into black anteriorly and posteriorly, much eroded towards the beaks; lines of growth not strong and very irregular; nacre bluish-white, slightly iridescent.

Length 86, height 42, of umbones 39, length of anterior region 27, of posterior region 63, diam. 34 mm." (Germain).

Type locality, Le Mamoun, Senoussi Country.

Spatha (Leptospatha) decorsei GERMAIN, Bull. Mus. Hist. Nat., 1904, p. 469; l'Afrique Cent. Fr., 1907, p. 557, pl. lith. fig. 5.

"This species is to be distinguished from the *Spatha (Leptospatha) stuhlmanni* von Martens by its subparallel dorsal and ventral margins; by its anterior region less shortly truncate; by its posterior region more elongated, but terminating in a beak much less sharp and not central and decidedly truncate as in *Sp. stuhlmanni*, but decidedly basal and broadly convex; by the ventral margin not convexly upcurved towards the posterior region, but descending and very decidedly sinuous in the central part, etc."

Var. *persinuata* Germain.

"Differs from the type by its general form being higher towards the posterior region; by its posterior region much more sloping and terminating in a beak much shorter, decidedly convex and placed very low; by its ventral margin very much more sinuous; by its maximum diameter being nearer to the dorsal margin; by its stronger ligament, etc. Epidermis very dark brown, almost black, deeply and extensively eroded in the umbonal region, showing a lead-colored nacre; lines of growth more regular and stronger than in the type; nacre Prussian blue, slightly iridescent.

Length 74, height 39, of beaks 33, length of anterior region 24, of posterior region 52, diam. 29 mm." (Germain).

Type locality, Le Mamoun, associated with the type.

Spatha (Leptospatha) decorsei var. *sinuata* GERMAIN, Bull. Mus. Hist. Nat., 1904, p. 469.

Spatha (Leptospatha) decorsei var. *persinuata* GERMAIN, l'Afrique Cent. Fr., 1907, p. 558, fig. 93.

"I have changed the name that I had previously given to this variety because there is already a *Spatha sinuata* Martens and the use of the same name might lead to confusion."

SPATHA SUBRENIFORMIS (Sowerby).

"Shell compressed, solid, thick, somewhat arched, oblong, reticulated with close, concentric wrinkles and radiating striæ, brownish-green, white within, bluish towards the margin; posterior side angular, acuminated at the end; dorsal margin straight; lateral margin obliquely convex, middle depressed; ventral margin arched; anterior end rather short, with short dorsal margin, umboes smooth, prominent.

Length (of figure) 60, height 30 mm." (Sowerby).

Type locality, Lake Nyassa.

Anodon subreniformis SOWERBY, Conch. Icon., XVII, 1867, pl. XIV, fig. 50.

Anodonta subreniformis PÆTEL, Conch. Sam., III, 1890, p. 185.

Spatha subreniformis SIMPSON, Syn., 1900, p. 900.

"In form resembling *An. senegalensis,* but much flatter and with a more reticulated surface. *An. senegalensis* is also characterized by a radiating posterior rib, which is wanting in the present species."

SPATHA PFEIFFERIANA (Bernardi).

Shell oblong, subrhomboid, apparently convex and subsolid, inequilateral; beaks somewhat elevated; posterior ridge rounded, ending near the base in a blunt rounded point, with a slight, radial ridge above it; surface smooth, with concentric striæ; epidermis greenish-black; muscle scars well marked; nacre blackish-green behind, lighter in front.

Length 72, height 36 mm.

Gaboon; West Africa.

Margaritana pfeifferiana BERNARDI, Jl. de Conch., IV, 1860, p. 331, pl. XII, figs. 1, 2.

Margaron (Margaritana) pfeifferiana LEA, Syn., 1870, p. 68.

Spatha pfeifferiana SIMPSON, Syn., 1900, p. 900.

Spatha pfeifferi GERMAIN, Arch. Zool. Exp. et Gen., (5), I, 1909, p. 56.

The description given by M. Bernardi is very brief, several of the important characters being entirely omitted. I have based the above description largely on the excellent figures. The species is remarkable for its dark color within and without, being a blackish-green throughout.

Germain, (l. c.), remarks that it is, "perhaps, only a variety of *S. tawai* Rang.

SPATHA DAHOMEYENSIS (Lea).

Shell elongate, subrhomboid, rather thin or scarcely subsolid, convex, inequilateral; beaks moderately elevated, with delicate, oblique sculpture; posterior ridge full, rounded, ending near the base in a bluntly rounded point; dorsal and basal margins nearly parallel, curved so that the outline of the shell is slightly arcuate; anterior end rounded, usually a little narrower than the hinder end; posterior end obliquely truncate; left valve often having a feeble tooth; muscle scars well marked, but shallow; nacre bluish or greenish, often tinted or clouded with salmon.

Length 85, height 38, diam. 19 mm.

Length 55, height 25, diam. 18 mm.

West Africa.

Anodonta dahomeyensis LEA, Pr. Ac. N. Sci. Phila., III, 1859, p. 154; Jl. Ac. N. Sci. Phila., IV, 1859, p. 261, pl. XLI, fig. 141; Obs., VII, 1860, p. 79, pl. XLI, fig. 141.—CLESSIN, Conch. Cab. Ano., 1873, p. 103, pl. XXXI, figs. 5, 6.

Anodon dahomeyensis SOWERBY, Conch. Icon., XVII, 1870, pl. XXXVI, fig. 151.

Margaron (Anodonta) dahomeyensis LEA, Syn., 1870, p. 82.

Spatha dahomeyensis SIMPSON, Syn., 1900, p. 900.

Anodonta senegalensis LEA, Pr. Ac. N. Sci. Phila., III, 1859, p. 154; Jl. Ac. N. Sci. Phila., IV, 1860, p. 260, pl. XLI, fig. 140; Obs., VII, 1860, p. 78, pl. XLI, fig. 140.—CLESSIN, Conch. Cab. Ano., 1873, pl. XXXI, figs. 7, 8.

Anodon senegalensis SOWERBY, Conch. Icon., XVII, 1867, pl. XI, fig. 35; 1870, pl. XXXIII, fig. 130.

Margaron (Anodonta) senegalensis LEA, Syn., 1870, p. 82.

Spatha senegalensis GERMAIN, Arch. Zool. Exp. and Gen., (5), I, 1909, p. 57.

Mutelina senegalica JOUSSEAUME, Bull. Soc. Zool. de Fr., XI, 1886, p. 488.

Spatha divaricata VON MARTENS, Besch., 1897, p. 250, pl. VII, fig. 15.—SIMPSON, Syn., 1900, p. 901.—GERMAIN, Arch. Zool. Exp. et Gen., (5), I, 1909, p. 57.

A very variable and probably widespread, abundant species. Lea's *Anodonta senegalensis* is a little more elongated and inflated than some specimens, but does not differ varietally I think. The surface varies from being almost smooth to concentrically sculptured and some shells show traces of radial sculpture. The epidermis varies from dull greenish to greenish-brown. *S. divaricata* von Martens seems to be the young or a small form of *S. dahomeyensis*. I have seen small specimens of that, which agree in every essential particular. Martens' shell is from Lake Victoria Nyanza.

The National Museum possesses a shell of the above sent by Ancey and named *Mutelina senegalica* by Bourguignat himself.

Germain, (l. c.), erroneously gives priority to *senegalensis.* The same author, (l. c.), not only gives *divaricata* specific rank, but puts it in a group by itself.

SPATHA MARTINI (Rochebrune).

"Shell solid, round elliptical, inequilateral, gaping posteriorly; leek-green with bright yellow at the margins; white at the umbonal region, very polished and shining, very minutely, circularly striate; dorsal margin almost straight, oblique; anterior margin round; posterior abruptly descending, compressed, subalate; basal margin slightly convex; umbones contiguous, very small, transversely plicate, situated at almost 1-2 of the length; posterior slope subcompressed, quite distinctly margined by a bifid sulcus; ligament short, minute, internal; nacre pale whitish-yellow.

Length 38, height 27, diam. 15 mm." (Rochebrune).

Type locality, Bafing River, a tributary of the Senegal.

Mitriodon martini ROCHEBRUNE, Bull. Mus. Hist. Nat., 1904, p. 462.

Spatha (Leptospatha) martini GERMAIN, Arch. Zool. Exp. et Gen., (5), I, 1909, p. 49.

Mitriodon falemeensis ROCHEBRUNE, Bull. Mus. Hist. Nat., 1904, p. 462.

Mitriodon heudeloti ROCHEBRUNE, Bull. Mus. Hist. Nat., 1904, p. 462.

Germain, (l. c.), states that the three species above quoted are synonymous.

SPATHA COMPLANATA (Jousseaume).

Shell elongated, convex, thin, somewhat elliptical, inequilateral; beaks but little elevated; anterior end rounded, slightly narrowed; dorsal and basal outlines nearly straight; posterior end obliquely subtruncate above, bluntly pointed below the median line; surface nearly smooth, the epidermis being nearly all denuded in an adult state, the young shell is rose-tinted; the old shells are bluish; nacre pearly, rose-tinted, bluish in the cavities.

Length 46, height 23, diam. 12 mm.

Upper Senegal; Niger River.

Mutelina complanata JOUSSEAUME, Bull. Soc. Zool. de Fr., XI, 1886, p. 489, pl. XIII, figs. 1, 1*a*.—GERMAIN, Arch. Zool. Exp. et. Gen., (5), I, 1909, p. 57.

Spatha complanata SIMPSON, Syn., 1900, p. 900.

I have never seen this species, which is formed something like *S. dahomeyensis*. According to Jousseaume it has the aspect of *Psammobia vespertina*. This appearance and the almost entire want of epidermis in an adult state would seem to be good distinguishing characters.

Var. *curta* (Germain).

"Shell less elongated, the posterior region being in proportion to the anterior very much shorter and higher than in the typical form; dorsal margin slightly convex, notably ascending and not subrectilinear: ventral margin decidedly convex.

Length 26, height 15.5, diam. 8 mm." (Germain).

Type locality, the Chari and the Bangoran.

Mutelina complanata var. *curta* GERMAIN, Bull. Mus. Hist. Nat., 1907, p. 68; l'Afrique Cent. Fr., 1909, p. 574.

"As in the type the shell is very compressed, thin, epidermis yellow, tinted with rose, passing to *café au lait* towards the beaks and to greenish-yellow towards the margins; the lines of growth are noticably stronger and more irregular."

Subgenus MONCETIA Bourguignat, 1885.

Moncetia BOURGUIGNAT, Esp. Ouk., 1885, p. 34.

Shell long-elliptical, inequilateral, compressed, thick, somber-colored; beaks compressed, smooth, sharp; hinge with a tubercular eminence near the beak of the right valve, with two internal ligaments and three groups of muscular impressions. (Bourguignat).

Animal unknown.

Type, *Moncetia anceyi* Bourguignat.

SPATHA ANCEYI (Bourguignat).

Shell elongated, subrhomboid, compressed, inequilateral; beaks low, sharply striate; dorsal and basal lines nearly parallel, the former arched, the latter slightly incurved so that the shell is slightly arcuate; anterior end rounded; posterior end obliquely truncate or subtruncate above; surface rudely and very irregularly concentrically sculptured, the margins of the ridges being apparently ragged; epidermis earthy-yellow, paler at the beaks; nacre bluish-white, slightly iridescent; right valve with a sort of obsolete tooth near the beak, left valve with a sort of rudimentary lateral; dorsal scars double or treble.

Length 52, height 24, diam. 13 mm.

Lake Tanganyika.

Moncetia anceyi BOURGUIGNAT, Esp. Ouk., 1885, p. 34; Icon. Mal., 1888, pl. XXX, fig. 1.

Moncetia jouberti BOURGUIGNAT, Un. and Ir., 1886, p. 63; Icon. Mal., 1888, pl. XXX, fig. 4.

Spatha anceyi SIMPSON, Syn., 1900, p. 901.

Spatha (Moncetia) anceyi GERMAIN, Arch. Zool. Exp. et Gen., (5), I, 1909, p. 50.

I have placed this and two other apparently related species, which their author Bourguignat has put in the genus *Moncetia*, as a subgenus under *Spatha*. I have never seen any of the forms belonging to this group and it may be that it should have generic rank. *M. jouberti* seems to me to be merely an old *M. anceyi*, which is more arcuate and somewhat drawn out at the posterior base. The shells gape in front and are thinner medially.

Germain, (l. c.), unites all the species of *Moncetia* under this species.

SPATHA MOINETI (Bourguignat).

Shell compressed, rather solid, arcuate, irregularly rhomboid, inequilateral; beaks low; dorsal outline strongly arched; base incurved; anterior end a little narrowed, subangulate above; dorsal slope obliquely subtruncate; surface strongly and irregularly, concentrically sculptured; epidermis subolivaceous-chestnut, slightly shining; nacre subolivaceous to whitish.

Length 55, height 33, diam. 15 mm.

Lake Tanganyika.

Moncetia moineti BOURGUIGNAT, Un. and Ir., 1886, p. 61; Icon. Mal., 1888, pl. XXX, fig. 7.

Moncetia rochebruneana BOURGUIGNAT, Nouv. Mal., 1886, p. 62; Icon. Mal., 1888, pl. XXX, fig. 8.

Spatha monieti SIMPSON, Syn., 1900, p. 901.

The sculpture is apparently less ragged than in *S. anceyi* and the nacre is rose-tinted. The *Moncetia rochebruneana*, as figured by Bourguignat in his Iconographie, is a specimen with the posterior end badly diseased and does not seem to me to differ otherwise from *moineti*. The anterior end gapes slightly.

SPATHA LAVIGERINA (Bourguignat).

Shell compressed, somewhat elongated, lightly arcuate, inequilateral; beaks low; dorsal outline arched; basal outline a little incurved; anterior end rounded, angled above; posterior ridge having a tendency to be double, ending in a feeble biangulation at the base of the shell, with a faint, wide, radial ridge above it; dorsal slope lightly, obliquely truncate; surface densely, concentrically sculptured; epidermis fuscous chestnut to yellowish; sometimes having greenish rays behind; nacre white to violet-tinted, bright.

Length 61, height 32, diam. 15 mm.

Lake Tanganyika.

Moncetia lavigerina BOURGUIGNAT, Nouv. Mal., 1886, p. 60; Icon. Mal., 1888, pl. XXX, fig. 6.

Spatha lavigerina SIMPSON, Syn., 1900, p. 901.

Moncetia bridouxi BOURGUIGNAT, Un. and Ir., 1886, p. 65; Icon. Mal., 1888, pl. XXX, fig. 5.

The posterior end of this is wider than in the other forms and is somewhat biangulate. The *M. bridouxi* seems to me to be a young shell, which is slightly rayed behind.

Subgenus ASPATHARIA Bourguignat, 1885.

Aspatharia BOURGUIGNAT, Esp. Ouk., 1885, p. 14.

Shell elongated rhomboid, somewhat compressed, with a full, rounded posterior ridge, from which curved rows of fine, broken corrugations radiate; epidermis dark olive, wrinkled, rayless; beak sculpture not seen; hinge with a low, slightly elevated ridge in the left valve in front of the beak; dorsal scars small; nacre lurid, bluish-green. Animal as in *Spatha*.

Type, *Margaritana vignoniana* Bernardi.

This may be a distinct genus, though its characters seem to agree fairly well in most respects with those of *Spatha*. Bourguignat does not describe the muscle scars or tell anything of the nacre.

SPATHA VIGNONIANA (Bernardi).

Shell long rhomboid, rather solid, subcompressed or convex, inequilateral; dorsal line slightly curved; base line lightly curved, straight or incurved medially; anterior end rounded; posterior ridge full, narrowly rounded, ending in a blunt point at or near the base of the shell; above the posterior ridge there is a wide, shallow, radial depression; dorsal slope obliquely truncate, sometimes its outline is a little incurved; surface closely and sharply sculptured with curved, wavy, subnodulous ridges, which are divaricate on the posterior ridge; epidermis a peculiar lurid greenish-olive, quite dark; sometimes there is a sort of feeble ridge in the left valve at the beak; muscle scars shallow, the front one of the anterior ones vertical and the hinder one small and horizontal; dorsal scars one or two; nacre livid, dark, bluish or greenish, sometimes clouded with salmon.

Length 57, height 28, diam. 15 mm.
Length 58, height 27, diam. 15 mm.
Gaboon, West Africa.

Margaritana vignoniana BERNARDI, Jl. de Conch., VII, 1858, p. 302, pl. x, fig. 1.

Unio vignoniana REEVE, Conch. Icon., XVI, 1865, pl. xxv, fig. 120.

Spatha vignoniana SIMPSON, Syn., 1900, p. 902.

Anodonta vignonana MUSGRAVE, Phot. Conch., 1863, pl. I, fig. I.

Anodon vignonanus REEVE, Conch. Icon., XVII, 1870, pl. XXIX, fig. 116.

Margaron (Unio) vignonana LEA, Syn., 1870, p. 32.

Margaron (Margaritana) vignouana LEA, Syn., 1870, p. 67.

Spatha vignoni GERMAIN, Arch. Zool. Exp. et Gen., (5), I, 1909, p. 57.

? *Anodonta rugifera* DUNKER, Mal., Bl., V, 1858, p. 225.

This remarkable form, of which several specimens are before me, seems to have most of the characters of the genus *Spatha*, hinge, muscle scars, etc. In typical *Spatha* there is only a single dorsal scar in each valve, in this species there may be one or two, while *Moncetia* may have three. *A. rugifera* Dunker probably equals *S. vignoniana* Bernardi, but there is only a Latin description. Both were published the same year.

SPATHA CORRUGATA Dautzenberg.

Shell rather solid, convex, oblong, subrhomboid, inequilateral; beaks low; dorsal outline almost regularly curved from the anterior to the posterior end of the shell; anterior end somewhat narrowed, rounded, subangulate above; base line very lightly curved; posterior ridge low, somewhat double, ending in a wide biangulation at and below the median line; surface slightly corrugated over the earlier growth, striate on the later growth; epidermis blackish-chestnut; nacre whitish at the border, greenish within; hinge thick, edentulous; dorsal scars apparently two in each valve; anterior scars as in *S. vignoniana*.

Length 70, height 42, diam. 24 mm.

River Niari, West Africa.

Spatha corrugata DAUTZENBERG, Jl. de Conch., XLI, 1893, p. 50, pl. VIII, fig. 5.—SIMPSON, Syn., 1900, p. 902.

Quite different in form from *S. vignoniana*, but it has a sculptured surface, and apparently, from the figure, two dorsal scars in each valve. The wide posterior biangulation, and the evenly, rounded dorsal outline will at once distinguish it from *S. vignoniana.* The dimensions given for this species are, no doubt, erroneous and probably the result of a typographical error. The statement that the length is 17 millimeters should read 70 or 71, I presume.

SPATHA SEMICORRUGATA Preston.

"Shell oblong, solid, covered with a blackish-brown periostracum, which is minutely wrinkled posteriorly, sculptured with rather coarse lines of growth and corrugated on the upper portion of the posterior side; umboes small, situated somewhat anteriorly; ligament elongate, not prominent; dorsal margin slightly arched posteriorly, sloping anteriorly; ventral margin nearly straight; anterior side angled, bluntly acuminate; interior of shell rosy pink, iridescent, especially towards the margins.

Long. 51.5, lat. 87 mm." (Preston).

Type locality, Lower Congo.

Spatha semicorrugata PRESTON, Ann. Mag. Nat. Hist., (8), IV, 1909, p. 90, pl. IV, fig. 7.

SPATHA KAMERUNENSIS Walker.

"Shell oblong-ovate, somewhat inflated, subsolid; beaks eroded, but apparently only slightly elevated, sculpture not observed, placed about 1-5 of the total length from the anterior end; anterior end regularly rounded; basal and dorsal lines nearly parallel, slightly diverging posteriorly; basal line nearly straight, in some specimens slightly arcuate; dorsal line straight or slightly curved; dorsal slope oblique; posterior end somewhat prolonged and regularly rounded; posterior ridge rounded, exhibiting in some specimens, a subobsolete angle, terminating at the lower end of the dorsal slope; dorsal slope sculptured with fine, radiating ridges, curving upwards towards the hinge; surface of the disk subsulcate with strong lines of growth, cut by very fine, impressed, radiating lines, between which the epidermis is minutely and irregularly wrinkled or festooned; epidermis very dark brown, almost black towards the margins; hinge edentulous; beak cavity shallow, with a single, deep, dorsal cicatrix directly under the beak;

at the posterior end of the ligament, there is a triangular notch in the dorsal border of the nacreous area; impressions of the adductor muscles large, well marked, irregularly oval; that of protractor pedis reniform, situated slightly behind and at the base of that of the anterior adductor; posterior adductor impression large, oval; that of the posterior retractor small, elongated-oval, separate from that of the posterior adductor and situated immediately below the notch at the end of the ligament; nacre dark, dull plumbeous, tinged with green, more intense towards the beak cavity; scarcely iridescent posteriorly. Length (of type) 69, height 35.5, diam. 22 mm." (Walker).

Type locality, Kribi River, 17 miles from Efulen, Kamerun.

Spatha kamerunensis Walker, Nautilus, XXIV, 1910, p. 38, pl. III, figs. 1, 2.—Ortmann, Ibid; p. 39.

"Ten specimens, in alcohol, of this very distinct species were sent by Mr. George Schwab to the museum of the Univ. of Mich.

By reason of its sculptured surface, it evidently belongs to the subgenus *Aspatharia* Bgt., as recognized by Simpson (1900) and Germain (1909).

In size, shape and in the peculiar sculpturing of the surface, which requires the use of a lens to develop the detail, it is easily distinguishable from both of the allied species."

The following are unfigured and unidentified species:

Spatha pangallicensis Rochebrune, Bull. Soc. Phil., VI, 1882, p. 33.

Upper Senegal.

Spatha baikii H. Adams, Proc. Zool. Soc. Lond., 1866, p. 447. Niger River.

Spatha anataria Jickeli, Faun. Suss. Moll. N. O. Af., 1874, p. 266.

Chambardia Bourguignat in Servain, 1891. New name for the Egyptian *Iridinidæ*.

Chambardia bourguignati, C. locardiana, C. letourneuxiana, C. pharaonum, C. rhynchonella, C. rhynchoidea. Some of these are credited to Bourguignat and some to Servain. I do not know what they are. They are probably Moncetias.

Genus MUTELA Scopoli, 1777.

Mutela Scopoli, Intr. Nat. Hist., 1777, p. 397.
Iridina Lamarck, An. sans Vert., VI, 1819, p. 88.
Calliscapha Swainson, Tr. on Mal., 1840, p. 380.
Eufira Gistel, Naturg. Hohe Schul., 1848, p.
Mutelina Bourguignat, Esp. Ouk., 1885, p. 11.

Shell elongated, slightly inflated, with low, smooth beaks, and a rounded posterior ridge; surface faintly concentrically grooved; epidermis rayless; hinge straight, having generally vestiges of taxodont teeth; dorsal scars an irregular row, extending downward and forward; muscle scars irregular.

Animal having the palpi longer than wide, not united; mantle margin united as far as the foot, so that the branchial and anal openings are closed; outer branchiæ united to the mantle to the extremity; inner entirely united to the foot; foot tongue-shaped, somewhat produced anteriorly. *Iridina cœlestis* Lea, (Troschel).

Type, *Iridina exotica* Lamarck.

Although in a number of cases the shells of this group resemble those of *Spatha,* there are certain reasonably constant conchological differences. In *Spatha* the hinge is never dentilate, the anterior muscle scars are two in number and distinct, the adductor scar being placed close to the border of the shell and usually vertically elongated. The dorsal scars are deep and distinct, one to three in number, and the valves are generally well closed all around. In *Mutela* the hinge is either dentilate or usually shows vestiges of dentilations, the anterior scars are irregular, often three in number and faint, the dorsal scars are numerous and blurred, and the valves gape at the anterior base and behind. The anatomical differences, so far as is known are not great. In *Spatha* the mantle margin is entirely open below as in the *Unionidæ;* in Mutela it is closed below, the lobes being united as far forward as the foot, as in the marine *Pholadidæ.*

Group of *Mutela exotica.*

Shell elongate, rhomboid, wider and subtruncated behind, subsolid.

MUTELA EXOTICA (Lamarck).

Shell elongated, scarcely subsolid, somewhat rhomboid, being wider behind than in front, subinflated, inequilateral: umbonal region somewhat raised and inflated, elongated; posterior ridge full and rounded above, fading out below; dorsal line nearly straight; base line straight or slightly incurved medially, full behind the middle; anterior end rounded, but cut away below; posterior end obliquely subtruncate; epidermis greenish; hinge containing a great number of irregular, rudimentary teeth; nacre brilliant, pale reddish or coppery; muscle scars feeble, irregular; dorsal scars forming an uneven row; pallial line faint, somewhat sinused behind.

Length 155, height 55, diam. 35 mm.

Tropical Africa.

Iridina exotica LAMARCK, An. sans Vert., VI, 1819, p. 89; Enc. Meth., II, 1827, p. 147, pl. CCIV, figs. 1, 1*b*.—SOWERBY, Conch. Icon., XVI, 1868, pl. 1, fig. 2.—CLESSIN, Conch. Cab. Ano., 1875, p. 231, pl. LXXI, fig. 1.

Anodonta exotica BLAINVILLE, Man., 1825, p. 538, pl. LXVI, fig. 3.

Platiris (Iridina) exotica LEA, Syn., 1838, p. 33; 1852, p. 54; 1870, p. 88.

Mutela exotica SIMPSON, Syn., 1900, p. 903.

Pliodon (Iridina) exotica GERMAIN, Arch. Zool. Exp. et Gen., (5), I, 1909, p. 58.

Pleiodon exoticus PÆTEL, Conch. Sam., III, 1890, p. 188.

Iridina elongata SOWERBY, Rec. and Fos. Shells, VII, 1821, fig. 1.—SOWERBY, Conch. Man., 1839, fig. 150.—SWAINSON, Tr. on Mal., 1840, p. 286, fig. 60.—REEVE, Conch. Syst., I, 1841, p. 122, pl. XCII.—SOWERBY, Conch. Icon., XVI, 1868, pl. 1, fig. 1.

Platiris (Spatha) elongata LEA, Syn., 1838, p. 34.

Mutela elongata PÆTEL, Conch. Sam., III, 1890, p. 187.

Iridina striata OKEN, Isis, 1834, p. 458.

? *Mutela soleniformis* Bourguignat, Esp. Ouk., 1885, p. 25. —Bourguignat, Icon. Mal., 1888, pl. xxii, fig. 2.

? *Mutela bridouxi* Bourguignat, Un. and Ir., 1886, p. 25; Icon. Mal., 1888, pl. xxii, fig. 1.

A fine species, which is narrowed in front and much cut away below anteriorly. The teeth extend throughout the length of the hinge line except at its extreme ends, and while a majority of them are irregular, many of them set crosswise of the hinge line.

Mutela dubia (Gmelin).

Shell elongated, subrhomboid, rather solid, subinflated, inequilateral; umbonal region full and somewhat elevated, elongated; posterior ridge high, narrowly rounded above, sometimes slightly double below; hinge line nearly straight; anterior end narrowed, rounded and cut away below; base straight or slightly incurved medially, fuller near the posterior end; posterior end obliquely truncate; surface with irregular, concentric sculpture; epidermis greenish, sometimes olive when old; dorsal scars irregular, placed in an oblique row; muscle scars well impressed, anterior ones irregular; nacre brilliant, greenish in young shells, coppery in old ones.

Length 106, height 47, diam. 29 mm.

Tropical Africa.

Le Mutel Adanson, Hist. Nat. du Sen., 1757, p. 234, pl. xvii, fig. 21.

Mytilus dubia Gmelin, Syst. Nat., 1788, p. 3368.

Anodonta dubia Bosc, Hist. Nat. Coq., III, 1824, p. 144.

Platiris (Spatha) dubia Lea, Syn., 1852, p. 55; 1870, p. 89.

Mutela dubia H. and A. Adams, Gen. Rec. Moll., II, 1857, p. 506; III, pl. cxix, figs. 1, 1*a*.—Clessin, Conch. Cab. Ano., 1873, p. 194, pl. xxv, fig. 3.

Iridina dubia Chenu, Man., 1859, II, p. 147, fig. 726.

Mytilus dubius Wood, Ind. Test. Rev., 1856, p. 69, pl. xii, fig. 36.

Mutela dubia Simpson, Syn., 1900, p. 903.

Iridina angustata Sowerby, Conch. Icon., XVI, 1868, pl. ii, fig. 5.

Mutela angustata Jickeli, Faun., N. O. Af., 1874, p. 268.—Simpson, Syn., 1900, p. 904.—Germain, l'Afrique Cent. Fr., 1907, p. 564.

Most of the characters of this species are the same as those of *M. exotica.* But it is a smaller, solider species, the surface is more strongly, concentrically sculptured, and the hinge is edentulous or has only the very faintest vestiges of teeth.

Further study of material received as *M. angustata,* since the Synopsis was published, leads me to believe that Sowerby's *Iridina angustata* is a synonym of *dubia.*

Germain, (l. c.), states that in his opinion the *angustata* Sby. should be considered as a variety of *M. nilotica* Caill., "from which it differs mainly in the divergence, more or less accentuated, of the dorsal and ventral margins."

Var. *curta* Germain.

"Shell much less elongated, measuring only 99 mm. in length for a height of 41 mm. and a diameter of 26 mm. Epidermis emerald-green; nacre rose-salmon, very iridescent." (Germain).

Type locality, The Lower Chari.

Mutela angustata var. *curta* Germain, Bull. Mus. Hist. Nat., 1906, p. 174, fig. 6; l'Afrique Cent. Fr., 1907, p. 565, fig. 94.

Var. *ponderosa* Germain.

"Valves very thick and heavy; heavily encrusted with a calcarious deposit; striæ large and undulating; nacre bright rose-salmon, very iridescent.

Length 118-149, height 41-64, diam. 28-42 mm." (Germain).

Type locality, Lake Tchad.

Mutela angustata var. *ponderosa* Germain, Bull. Mus. Hist. Nat., 1905, p. 489; Ibid, 1906, p. 56, fig. 1; l'Afrique Cent. Fr., 1907, p. 565, fig. 95.

Mutela nilotica (Sowerby).

Shell elongated, irregularly trapezoid, thin, gaping in front; umbonal region slightly elevated, elongated; posterior ridge full, widely rounded; dorsal outline lightly arched; posterior end obliquely truncate, rounded below; anterior end narrowed, rounded, very slightly cut away below; base incurved to behind the middle, quite full towards the posterior end; surface with irregular growth lines; epidermis greenish or olive-green; nacre iridescent; hinge edentulous, obsoletely crenulate in front.

Length 132, height 53 mm.

Tropical Africa.

Iridina nilotica Sowerby, Zool. Journal, I, 1835, p. 53, pl. II.—? Cailliaud, Voy. à Méroé, 1826, pl. LX, fig. 12.—Audouin, Savigny, Icon. Moll. Egypt, 1827, pl. VII, fig. 2.—Crouch, Ill. Int. Lam., 1827, p. 17, pl. X, fig. 1.—Deshayes, Tr. Elem., II, 1853, p. 219, pl. XVII, figs. 6, 7.—Chenu, Man., 1859, II, p. 148, fig. 727.—Sowerby, Conch. Icon., XVI, 1868, pl. II, fig. 4.

Platiris (Spatha) nilotica Lea, Syn., 1838, p. 33.

Mytilus niloticus Wood, Ind. Test. Rev., 1856, p. 207, pl. II, sup. fig. 1.

Mutela nilotica H. and A. Adams, Gen. Rec. Moll., II, 1857, p. 506.—Simpson, Syn., 1900, p. 904.

? *Mutela jouberti* Bourguignat, Un. and Ir., 1886, p. 28; Icon. Mal., 1888, pl. XXIII, fig. 1.

? *Mutela visseri* Bourguignat, Un. and Ir., 1886, p. 31.

Mutela vysseri Bourguignat, Icon. Mal., 1888, pl. XXIII, fig. 3.

According to Sowerby this species is obliquely inflated behind, but he does not give the diameter. The want of teeth behind should distinguish it from *exotica*, and the hinge line is more curved and the base fuller behind than in any of the allied forms.

Var. *emini* von Martens.

Lower in front and smaller, posteriorly ascending and proportionately swollen, so that the deepening between the posterior dorsal margin and the inflation extending from the beaks to the posterior end is very small; ventral margin straight, not incurved; height to length as 2-5.

Length 114, height 45, diam. 34 mm.

Mutela nilotica var. *emini* von Martens, Besch., 1897, p. 253. —Simpson, Syn., 1900, p. 904.

MUTELA ALATA (Lea).

Shell trapezoid, subcompressed, subsolid, inequilateral; beaks not elevated above the dorsal line; posterior ridge low, subangulate, the dorsal slope above it being radially excavated so as to produce a wide, shallow furrow; dorsal line straight, the hinder part raised into a decided wing, which is almost squarely subtruncate behind; anterior end narrow, rounded, base nearly straight, slightly incurved medially, the outline curved up behind; surface with fine irregular, concentric sculpture; epidermis yellowish-green, bronzy and iridescent; hinge edentulous; muscle scars impressed; dorsal and anterior scars very irregular; posterior scars double; nacre rose or coppery-tinted, iridescent.

Length 80, height 45.5, diam. 19 mm.

Lake Nyassa.

Spatha alata LEA, Pr. Ac. N. Sci. Phila., 1864, p. 109; Jl. Ac. N. Sci. Phila., 1866, p. 35, pl. XII, fig. 31; Obs., XI, 1867, p. 39, pl. XII, fig. 31.

Platiris (Spatha) alata LEA, Syn., 1870, p. 89.

Mutela alata CLESSIN, Conch. Cab. Ano., 1876, p. 196, pl. LXII, figs. 7, 8.—SIMPSON, Syn., 1900, p. 904.

Burtonia alata ANCEY, Bull. Mal. Fr., VI, 1889, p. 38.

This is a beautiful species with a rich, iridescent epidermis, which shows shadings of yellowish-green and bright green. It is, no doubt, closely related to *M. simpsoni,* but is more compressed, is more strongly winged, and does not show the strong, radial furrows on the front of the disk that Ancey's species does. Lea's shell shows faint indications of radial sculpture in front; it also gapes at the anterior base and slightly behind. The posterior end of his shell is somewhat diseased.

MUTELA SIMPSONI Ancey.

Shell only slightly elongated, subsolid, gaping in front and behind, trapezoid, inequilateral, subinflated; beaks low; dorsal outline straight in front, lightly winged behind; posterior end obliquely truncated; anterior end angled above, rounded below; base nearly straight; surface concentrically striate and furnished in front with a few widely spaced, radial, narrow grooves; epidermis yellowish-green, iridescent; hinge slender, smooth; nacre splendid rose-color, iridescent, whitish on the border.

Length 72, height 35, diam. 28 mm.

Shire and Karonga rivers, near Lake Nyassa.

Mutela simpsoni ANCEY, Mem. Soc. Zool. de Fr., VII, 1894, p. 233, fig. 8.—SIMPSON, Syn., 1900, p. 904.

Mutela alata var. *simpsoni* VON MARTENS, Besch., 1897, p. 253. —GERMAIN, Arch. Zool. Exp. et Gen., (5), I, 1909, p. 58.

Remarkable for the rather conspicuous radial furrows on the front half of the disk. The splendid rose-colored nacre should be a distinguishing character.

MUTELA HARGERI E. A. Smith.

"Shell irregularly triangular, alate, much compressed and very inæquilateral, white, covered with an olivaceous periostracum, striate with lines of growth and everywhere painted with very fine, close, radiating, greenish lines; anterior side short, obliquely curved, posterior side very broad, obliquely truncated above; ventral margin widely curved; valves thin, slightly raised or ridged in the middle between the umbo and the posterior side; interior of shell white, pearly, iridescent; hinge simple; ligament narrow, elongated, occupying the whole margin; anterior muscular impression not deep, irregularly rounded; posterior obscure, superficial.

Length 104, height 68, diam. 16 mm." (Smith).

Type locality, Lake Mweru.

Mutela hargeri E. A. SMITH, Proc. Mal. Soc. London, VIII, 1908, p. 14, text-fig.

"Only a single left valve of this species was obtained. The diameter above given is supposed to be that of a complete specimen. The radiating lines are hair-like and scarcely noticeable unless specially looked for. *Spatha alata* Lea, from Lake Nyassa, is an allied species, but less winged."

MUTELA BOURGUIGNATI Bourguignat.

Shell somewhat elongated, irregularly rhomboid, rather solid, convex, inequilateral; beaks low; posterior ridge full, rounded, ending in a rounded point at the base of the shell; above the ridge there is a wide, shallow, radial impression; dorsal line straight: anterior end rounded, much cut away below; base curved, full in the middle; posterior end obliquely truncate; surface regularly, concentrically striate, lightly shining, olive, obscurely, linearly rayed; hinge with faint teeth in front; nacre rich orange with whitish border, iridescent. Valves widely gaping at anterior base and behind.

Length 53, height 21, diam. 12 mm.

Lake Nyanza.

Mutela bourguignati BOURGUIGNAT, Esp. Ouk., 1885, p. 8.—SIMPSON, Syn., 1900, p. 904.

Decidedly long rhomboid, with the base somewhat produced medially. Bourguignat describes the nacre as splendidly iridescent, orange with a white border. Credited to Ancey *in litt.*

Var. *smithi* von Martens.

"Proportionately higher and shorter, the height being to the length as 1:2 2.25; the upper posterior angle is stronger, being about 140°; ventral margin very convex in the middle. Beaks situated at from 2-7 to 1-3 of the length.

Length 75-86, height of beaks 30-33, of wing 32.5-35, diam. 20-24, distance from the beaks to the end of the hinge 35-41 mm." (von Martens).

Type locality, Lake Victoria-Nyanza.

Mutela bourguignati E. A. SMITH, Ann. Mag. Nat. Hist., (6), X, 1892, p. 128, pl. 12, fig. 16.

Mutela bourguignati smithi VON MARTENS, Besch., 1897, p. 255.—GERMAIN, Arch. Zool. Exp. et Gen., (5), I, 1909, p. 58.

Var. *truncata* von Martens.

"Posterior end very short, more rapidly ascending below and steeper above; upper posterior angle being about 130°. Height to length as 1:2.33. Ventral margin only slightly curved.

Beaks situated at 1-3 of the length; posterior angle at 4-5 to 5-6 of the length.

Length 85, height at beaks 33, at wing 37, diam. 22, from the beaks to the end of the hinge 40 mm." (von Martens).

Type locality, Lake Victoria-Nyanza.

Mutela bourguignati var. *truncata* von Martens, Besch., 1897, p. 255, pl. vii, fig. 17.

Group of *Mutela rostrata*.

Shell somewhat inflated, thin, elongated, with a low, rounded posterior ridge ending in a point about midway up from the base; beaks low, smooth; epidermis bluish-green, rayless; hinge line edentulous or having only the faintest vestiges of denticles; muscle scars large, shallow, indistinct; nacre bluish, shaded violet.

Animal the same as in typical *Mutela*.

Mutela rostrata (Rang).

Shell elongated, thin, convex, irregularly elliptical, inequilateral; beaks somewhat full, elongated, nearly or quite smooth; dorsal line straight; basal line straight or slightly curved; anterior end regularly rounded or sometimes slightly cut away below; dorsal slope often feebly winged, obliquely truncate; posterior ridge well developed, narrowly rounded, ending in a rather sharp point about on the median line; surface with fine, irregular, concentric sculpture and faint, radial markings; epidermis olive-green, usually dark; muscle scars shallow; nacre bluish, tinted with violet, sometimes rosy-purplish or salmon-tinted.

Length 104, height 32.5, diam. 17 mm.

Length 90, height 32.5, diam. 20 mm.

Tropical Africa.

Iridina rostrata Rang, Nouv. Ann. Mus., 1835, p. 316.—Potiez and Michaud, Gall. Moll., 1844, p. 147, pl. lvi, fig. 1.

Spatha rostrata von Martens, Mal. Bl., XIII, 1866, p. 11.

Mutela rostrata Jickeli, Faun., 1874, p. 269.—Simpson, Syn., 1900, p. 905.

Mutelina rostrata BOURGUIGNAT, Bull. Soc. Zool. Fr., II, 1886, p. 488.—GERMAIN, Arch. Zool. Exp. et Gen., (5), I, 1909, p. 57.

Iridina cœlestis LEA, Syn., 1836, p. 57; Tr. Am. Phil. Soc., VI, 1838, p. 82, pl. XXII, fig. 70; Obs., II, 1838, p. 82, pl. XXII, fig. 70.—SOWERBY, Conch. Icon., XVI, 1868, pl. II, fig. 3.

Platiris (Spatha) cœlestis LEA, Syn., 1838, p. 33; 1852, p. 55; 1870, p. 89.

Mutela cœlestis CLESSIN, Conch. Cab. Ano., 1876, p. 193, pl. XXV, figs. 1, 2.

Mutela subdiaphana BOURGUIGNAT, Moll. Fluv. Ny., 1883, p. 5.—SIMPSON, Syn., 1900, p. 906.

Mutelina tholloni ROCHEBRUNE, Bull. Mal. Soc. Fr., III, 1886, p. 7.

Mutelina thottoni SIMPSON, Syn., 1900, p. 906.

Mutelina legumen ROCHEBRUNE, Bull. Mal. Soc. Fr., III, 1886, p. 6.—SIMPSON, Syn., 1900, p. 906.

Mutelina prasina ROCHEBRUNE, Bull. Mal. Soc. Fr., III, 1886, p. 7.—SIMPSON, Syn., 1900, p. 906.

Usually thin, dark olive-green and sharply pointed behind on the median line. In most cases the nacre is deep blue-tinted with violet and is brilliantly iridescent to rather dull. I have before me a somewhat solid shell with salmon-tinted purplish nacre, which is probably this. The shell gapes at the anterior base and behind.

MUTELA MABILLI (Rochebrune).

"Shell elongate wedge-shape, rather heavy, short in front, narrowly rounded, gaping; elliptically subrostrate behind; concentrically and deeply sulcate, radiate in front, broadly sulcate behind, covered with an undulating, striate epidermis at the extremities; dorsal margin at first nearly straight, then incurved and extending in a long, compressed wing; ventral margin nearly straight; umbones widely eroded, white tinged with copper-color; epidermis olivaceous-brown; nacre bluish, copper-color, shining.

Length 75, height in front 16, in the middle 24, behind 26, diam. 13 mm." (Rochebrune).

Type locality, Gancini, Congo.

Mutelina mabilli ROCHEBRUNE, Bull. Soc. Mal. Fr., III, 1886, p. 7.—SIMPSON, Syn., 1900, p. 906.

Mutelina mabillei GERMAIN, l'Afrique Cent. Fr., 1907, p. 569.

Mutelina paludicola ROCHEBRUNE, Bull. Soc. Mal. Fr., III, 1886, p. 8.—SIMPSON, Syn., 1900, p. 906.

Var. *frasi* (Germain).

"Shell very much longer; dorsal and ventral margins more divergent; posterior region more developed, terminating in a subtruncate, rounded beak, placed very low. Shell quite thick, solid, epidermis brown-chestnut, slightly reddish posteriorly, greenish towards the beaks, which are much eroded; lines of growth strong and irregular; nacre blue, quite iridescent.

Length 63, height 24, diam. 13 mm." (Germain).

Type locality, The Niger.

Mutelina mabillei var. *frasi* GERMAIN, Bull. Mus. Hist. Nat., 1907, p. 67; l'Afrique Cent. Fr., 1909, p. 580, fig. 97.

Var. *gailliardi* (Germain).

"Shell of medium size, narrowly elongate, slightly siliquiform, quite compressed; valves decidedly gaping in front and very much so behind; dorsal and ventral margins nearly parallel; dorsal margin straight; ventral margin nearly straight, slightly sinuous in the middle; antero-dorsal angle acute; anterior region very short, subconical, rounded, decidedly cut away at the base; posterior region very long, four times as long as the anterior, terminating in a beak obliquely truncate and rounded; beaks small, not prominent, incurved, eroded; dorsal ridge very blunt; ligament 31 mm. long, not prominent, brownish; hinge filiform; anterior muscular impressions deep; posterior quite deep; pallial line very strongly marked.

Shell quite solid; epidermis yellowish, passing into a deep brown anteriorly and slightly grayish towards the beaks; lines of growth irregular, sharp, much stronger and slightly lamellose posteriorly; nacre bluish, slightly rosy towards the beaks, very iridescent.

Length 58, height 24, of anterior region 11, of posterior region 48, diam. 12.5 mm." (Germain).

Type locality, Lake Tchad.

Mutelina mabillei var. *gaillardi* Germain, Bull. Mus. Hist. Nat., 1909, p. 477.

"Compared with *Mutelina mabillei* var. *frasi* Germain, this shell is distinguished: By its general form; by its dorsal and ventral margins being parallel and not divergent; by the peculiar form of the anterior region, which is, besides, very much shorter; by its more rounded posterior region; and finally by its slightly thicker and much more heavy shell."

Mutela falemeensis (Germain).

"Shell moderately long, decidedly compressed; valves thin, fragile, gaping at both ends; dorsal and ventral margins very divergent; dorsal margin subrectilinear, decidedly ascending; ventral margin convex; anterior region rounded; posterior region two and one-half times as long as the anterior, remarkably enlarged and terminating in a large beak, placed very high; beaks small, not prominent; ligament long and strong; muscular impressions feeble.

Length 66, height 32, diam. 13 mm." (Germain).

Type locality, River Faleme, Senegal.

Mutelina falemeensis Germain, Bull. Mus. Hist. Nat., 1907, p. 67; l'Afrique Cent. Fr., 1907, p. 569, fig. 96.

Subgenus Pseudomutela Simpson, 1900.

Pseudomutela Simpson, Syn., 1900, p. 905.

Shell rather thin, elongate, wide, round and gaping behind, cut away and gaping at the anterior base; beaks low; surface rudely sulcate; a series of irregular, nodulous projections extends down the low posterior ridge; hinge edentulous, with a kind of faint, broken internal ligament, with a wide prismatic streak behind; muscle scars distinct, united, the anterior protractor, however, separated and irregular; nacre lurid violet, iridescent behind.

Type, *Mycetopus plicatus* Sowerby.

MUTELA PLICATA (Sowerby).

Shell much elongated, somewhat obovate, scarcely subsolid, convex, very inequilateral; widely gaping in front and behind; beaks low; posterior ridge slightly developed above, fading out below; dorsal margin straight; anterior end narrowed, rounded, cut away below; posterior end almost evenly rounded; base nearly straight; surface with irregular, concentric sculpture, and a series of uneven folds and low humps along the line of the posterior ridge; epidermis pale greenish-brown, subshining; hinge line narrow in front, wider and showing the prismatic layer behind, edentulous; muscle scars shallow, quite irregular; nacre lurid violet, iridescent.

Length 112, height 38.5, diam. 20 mm.

Syene, Upper Egypt.

Mycetopus plicatus SOWERBY, Conch. Icon., XVI, 1868, pl. 11, fig. 3.—FISCHER, Jl. de Conch., XXXVIII, 1890, p. 8.—PÆTEL, Conch. Sam., III, 1890, p. 187.

Platiris (Mycetopus) plicatus LEA, Syn., 1870, p. 90.

Mutela plicata JICKELI, Faun. Moll. N. Ost-Af., 1874, p. 270.—SIMPSON, Syn., 1900, p. 905.

Mutelina plicata GERMAIN, Arch. Zool. Exp. et Gen., (5), I, 1909, p. 58.

There is a specimen in the National Museum from Syene, which agrees generally with the shell figured and partly described by Sowerby. It is rather darker in color, has lower beaks, and the foldings on the posterior part are not so regular as his figure shows. Whether these foldings and humps are normal or the result of disease I am unable to say.

This is certainly not a *Mycetopoda,* but is evidently nearer *Mutela* than anything. I have placed it in that group as a subgenus, though it may be worthy of generic rank.

MUTELA JOUBINI (Germain).

"Shell large, narrowly elongate, siliquiform, quite compressed; valves thin, fragile, gaping at both ends, decidedly so in front, very much more posteriorly; dorsal and ventral margins slightly diverging; dorsal margin nearly straight, but slightly ascending; ventral margin long and regularly subconvex; antero-dorsal angle well marked; anterior region very short, rounded, cut away at the base; posterior region remarkably developed, more than 5 1-2 times as long as the anterior, terminating in a long, well-rounded beak; beaks small, only slightly prominent, much eroded; dorsal ridge at first prominent, but much reduced towards the extremity; ligament very long, strong, somewhat prominent, brilliant brown, length 53 mm; hinge filiform; anterior muscular impressions quite deep, posterior feeble, but quite visible, pallial well marked. Epidermis light chestnut-color, yellowish in the centre of the disk and towards the margins, eroded towards beaks, revealing a very iridescent, salmon-tinted nacre; lines of growth quite fine, not very regular, light in the middle, becoming stronger and somewhat lamellose towards the posterior region; nacre brilliantly iridescent, salmon-color under the beaks, greenish-blue towards the margins.

Length 117, height 39 mm. at 55.5 mm. from the beaks, in front of the beaks 31, length of the anterior region 17.5, of the posterior region 101, diam. 18 mm." (Germain).

Type locality, The Upper Oubangui.

Mutelina joubini GERMAIN, Bull. Mus. Hist. Nat., 1904, p. 470; l'Afrique Cent. Fr., 1907, p. 572, pl. lith., fig. 2.

"This magnificent species can be compared only with *Mutelina plicata* Sowerby. It is to be distinguished by its much longer posterior region, which is not truncate at the end, but very regularly ovally rounded; by its greatest height being nearer to the beaks, which are notably smaller and less prominent, etc."

SPECIES INCERTÆ SEDIS.

MUTELA L'HOTELLERIANA Preston.

"Shell rhomboidal, slightly gaping at both sides, covered with an olive-green periostracum, marked with coarse, irregular, concentric lines of growth and indistinct, radiate ridges, a minute, oblique, striate sculpture being apparent in places under a lens; umboes small, not prominent, situated very anteriorly; dorsal margin sloping; ventral margin nearly straight; anterior side flattened, rounded; posterior side tumid, somewhat rostrate, sloping above, rounded below; interior of shell pale livid flesh-color.

Length 85, height 35 mm." (Preston).

Type locality, Gaboon.

Mutela l'hotelleriana PRESTON, Ann. Mag. Nat. Hist., (8), IV, 1909, p. 89, pl. IV, fig. 6.

MUTELA OPALESCENS Preston.

"Shell moderately thin, irregularly rectangular, posteriorly angled, covered with a thin olive-brown periostratum, sculptured with fine, irregular lines of growth and fine, transverse, radiate striæ, which are more apparent anteriorly; umbones eroded, very small, flattish; dorsal margin ascending, anteriorly straight, posteriorly very slightly curved at the top of an almost wing-like expansion; ventral margin scarcely rounded, very slightly constricted towards the middle; anterior side short, descending obliquely, somewhat excavated; posterior side produced below, bluntly rounded; hinge teeth obsolete; adductor scars moderately impressed; pallial impression rosy, iridescent pink; outer margins opalescent, the radiate striæ very noticeable in the interior of the shell.

Length 73, height 35 mm." (Preston).

Type locality, Shiré River, at a point from 3 to 4 kilometres to the south of Lake Nyassa.

Mutela opalescens PRESTON, Ann. Mag. Nat. Hist., (8), VI, 1910, p. 62, pl. IV, fig. 12.

"In places where the periostracum is lacking, through process of erosion, the shell appears to be highly iridescent."

MUTELA CUNEATA Preston.

"Shell differing from *M. opalescens* by its narrower and more elongate form, much more solid texture, and in the adductor and other scars in both valves being much more deeply impressed; the interior of the shell is more nacreous and presents a finely granular appearance, which is not the case in

M. opalescens; moreover the transverse striæ do not appear in the interior of the shell as in that species.

Length of type specimen 81, height 36 mm." (Preston).

Type locality, Karonga, north end of Lake Nyassa.

"I have before me a good series of this shell, the largest specimen measuring 42.5 by 97 mm."

Mutela cuneata PRESTON, Ann. Mag. Nat. Hist., (8), VI, 1910, p. 62, pl. V, fig. 13.

MUTELA ALLUAUDI Germain.

"Shell quite large, generally rectangular-elongate, very globosely inflated; valves very convex with the greatest diameter near the dorsal margin, gaping in front and nearly the whole length of the ventral margin, widely gaping posteriorly; dorsal margin straight; ventral margin straight, very slightly sinuous in the middle, parallel to the dorsal margin; anterior region rounded; posterior region almost regularly rectangular, almost twice as long as the anterior, obliquely and sharply truncate at the extremity; dorsal ridge low; beaks slightly incurved, quite prominent, eroded, and showing an extremely iridescent nacre; ligament prominent, strong, 40 mm. long, very beautiful brilliant chestnut-color; hinge filiform; anterior muscular impressions round and well marked, the posterior larger and deeper, pallial well marked. Shell thick, solid, quite brilliant, epidermis a vinous chestnut slightly tinged with yellow, lighter near the beaks; lines of growth very fine and slightly unequal, a little stronger posteriorly; nacre very iridescent, with coppery reflections near the ventral margin.

Length 84, of anterior region 30, of posterior region 56, height 37, diam. 31 mm." (Germain).

Type locality, Lake Albert-Nyanza.

Mutela alluaudi GERMAIN, Bull. Mus. Hist. Nat., 1910, p. 544, pl. VIII, fig. 45.

"This magnificent shell reminds one, by its coloration, of the species of the genera *Pseudospatha* and *Brazzea* of Lake Tanganyika."

The following are unfigured Mutelas:

Mutela lavigerina Bourguignat, Un. and Ir., 1886, p. 26. Lake Tanganyika.

Mutela moineti Bourguignat, Un. and Ir., 1886, p. 27. Lake Tanganyika.

Iridina welwitschii Morelet, Voy. de Angola,, 1868, p. —.

Genus CHELIDONOPSIS Ancey, 1887.

Chelidonura Rochebrune, S. B. Nat. Fr., 1886, p. 3.

Chelidonopsis Ancey, Conch. Exchange, II, 1887, p. 22.—Germain, Arch. Zool. Exp. et Gen., (5), I, 1909, p. 4.

Shell elongated, thin, narrowed in front, gaping on the anterior basal part and winged on the front dorsal portion, rounded behind, with a pinched-up posterior ridge which develops into an open or closed tube near its hinder part; the shell ending in a diamond-shaped gap; epidermis shining, slightly, concentrically grooved; hinge-line narrow, straight, with faint vestiges of denticles; a deep furrow inside marking the position of the posterior ridge; muscle scars faint; nacre brilliant, iridescent.

Type, *Chelidonura arietina* Rochebrune.

Germain, (l. c.), has published an exhaustive study of the anatomy of this curious group and summarizes his conclusions as follows: "The *Chelinodopses* possess the typical organization of the *Mutelidæ,* slightly modified by secondary adaptations due to the *modus vivendi* peculiar to these animals. These secondary characters are the presence of two triangular, posterior prolongations of the mantle, which line the interior of the aliform extensions of the posterior region; the existence of a narrow projection of the mantle in consequence of the deep carinæ of the posterior region; the more accentuated individualization of the anal and branchial siphons, which are completely united their entire length, while they are generally free at their posterior extremity in the *Mutelæ* and *Mutelinæ.* The study of the anatomy thus corroborates the results obtained by the study of the shell and we are to consider the *Chelinodopses* as much evolved *Mutelæ.*"

CHELIDONOPSIS ARIETINA (Rochebrune).

"Shell ellipsoidal, anteriorly subcompressed, narrow; gaping widely and long; anterior dorsal angle acute; posterior region roundly ovoid, enormously gaping; surface concentrically sulcate with broad sulci; minutely radiately striate; lateral carinas twisted backwards in an acute, twisted, sublamellose wing and minutely recticulated on both sides; dorsal margin straight in front, somewhat concave behind; epidermis pale shining olivaceous, brownish posteriorly; nacre iridescent with blue and rose.

Length 124, height in front 8, in the centre 30, posteriorly 33, diam. in front 9, in the middle 17, behind 40, width of posterior gape 14, height 20 mm." (Rochebrune).

Type locality, Gancini, Congo.

Chelidonura arietina ROCHEBRUNE, Bull. Soc. Mal. Fr., III, 1886, p. 4, pl. 1, figs. 1-4.

Chelidonopsis arietina SIMPSON, Syn., 1900, p. 906.—GERMAIN, Bull. Mus. Hist. Nat., 1908, p. 162, fig. 32; Arch. Zool. Exp. et Gen., (5), I, 1909, p. 4, pl. 1, figs. 1-6.

"The *Chelidonura arietina* differs from its relative the *Chelidonura hirundo*: By its larger size; a shape decidedly ellipsoidal and not simply elongate; by the acute and not obtuse antero-dorsal angle; by the size of the posterior wings, the separation, elongation and twisting of the free extremities of the carinas; by the reticulation of the shell in the parts near the carinas; by the valves concentrically sulcate and not slightly striate; and finally by its different color."

CHELIDONOPSIS HIRUNDO (von Martens).

Shell elongated, subcompressed, thin, somewhat obovate, slightly inequilateral; beaks low or slightly elevated; posterior ridge pinched up sharply, and narrowly rounded, curving outwards or ending in a tubular process at its hinder termination; dorsal line straight, sometimes curved upward in front; anterior end very much narrowed, drawn out into a beak above, rounded, gaping and cut away below; base slightly curved; posterior end irregularly rounded, having a wide diamond-shaped gape; surface delicately, concentrically striate, with faint traces of radial sculpture; epidermis yellowish-green, brilliant and having a metallic luster, sometimes feebly rayed; muscle scars shallow, three in front (two of which are united), and two behind; hinge edentulous; nacre brilliant, violet-tinted.

Length 100, height 24, diam. at beaks 14, at posterior extremity 20 mm.

Length 100, height 28.5, diam. at beaks 13.5, at posterior end 26 mm.

Kongo region.

Spatha hirundo VON MARTENS, S. B. Nat. Fr., 1881, p. 122; Conch. Mitth., II, 1883, p. 139, pl. XXVII.

Chelidonura hirundo ROCHEBRUNE, Bull. Soc. Mal. Fr., III, 1886, p. 2, pl. I, figs. 5, 6.—VON MARTENS, S. B. Nat. Fr., 1886, p. 161, pl. I, figs. 5. 6.

Chelidonopsis hirundo SIMPSON, Syn., 1900, p. 906.

A remarkable form, apparently related to some of the Mutelas. A specimen before me has each posterior ridge developed into a tube after the manner of the young spines of *Unio spinosus*. Both tubes are more or less open behind; one is filled in part with nacreous matter, the other is open throughout its length. Behind these tubes in each valve is a secondary somewhat aborted tube. The anterior rostrum on each valve is slightly spreading.

CHELIDONOPSIS ROUBAUDI Germain.

"The general form of the shell is elongated ellipsoidal, recalling that of *Psammobia vespertina*, much compressed, gaping at both ends; anterior region regularly rounded, decidedly cut away below; posterior region twice as long, having on each valve a projecting carina, which extends from the beak to a point a little above the posterior extremity; dorsal margin subconcave, slightly ascending; ventral margin convex, almost parallel to the dorsal margin; antero-dorsal angle acute, postero-dorsal angle rather blunt; beaks compressed, not prominent, somewhat eroded, situated almost exactly at the anterior third of the shell; posterior ligament strong, very long, 36 mm.; anterior ligament thin and delicate; anterior impressions moderate; posterior very faint; pallial line faint. Valves thin, light, subtransparent, of a very beautiful brilliant olive-green, passing into a grayish-green posteriorly, with very narrow, diverging rays, more distinct towards the margins; lines of growth fine and irregular, a little stronger towards the ventral margin. Nacre quite iridescent, greenish-blue, sometimes tinged with orange towards the beaks.

Length 85, of anterior region 30, of posterior region 56, height 30, in front of the beaks 29, at the beaks 24, diam. 14 mm." (Germain).

Type locality, Stanley Pool.

Chelidonopsis roubaudi Germain, Bull. Mus. Hist. Nat., 1908, p. 160, figs. 31-33; Arch. Zool. Exp. et Gen., (5), I, 1909, p. 4, figs. 1, 4, 6.

"The *Chelidonopsis roubaudi* can only be compared with *Chelidonopsis arietina* Rochebrune. It can always be easily distinguished by the following characters:

a. By its more regularly semi-elliptical form, the anterior region being much shorter and very much rounder, although the antero-dorsal angle remains sharp.

b. The posterior ligament is more developed and proportionately stronger.

c. The anterior region, though presenting the same mode of articulation, has not the two small, diverging carinæ near the dorsal margin, which are present in *C. arietina*.

d. In *C. arietina* the posterior region has two, widely extending, tubular carinas, separated at their extremities, constituting, as it were, two wings. The characters of *C. roubaudi* are quite different: the carinas are not tubular, they are much less projecting and do not give rise to the wing formation so characteristic of the other species. A comparative examination of the figures shows, that *C. roubaudi* is, evidently, a connecting link between the genera *Chelidonopsis* and *Mutelina* Bgt., permitting the definite determination of the true affinities of *Chelidonopsis,* which, by the peculiar character of the shell, appears widely separated from the other African groups."

Genus BRAZZÆA Bourguignat, 1885.

Brazzæa BOURGUIGNAT, Esp. Ouk., 1885, p. 32.

Shell thin, transparent, brilliant wine-colored, elliptical, greatly inflated, with a slight post-dorsal wing, and a high, double posterior ridge; beaks smooth, compressed, but the region below them full; hinge edentulous, filiform, with two ligaments, one internal, the other external; there are three groups of muscular impressions and several dorsal scars running in a row from the beak forward and downward; upper border of the left valve projecting over that of the right, forming a sinuous wing.

Animal unknown.

Type, *Brazzæa anceyi* Bourguignat.

A set of Naiades inhabiting Lake Tanganyika of rather light structure, generally inflated, with edentulous hinges. The upper border of the left valve is said to project over that of the right. The texture of the shells is generally a rich violet or wine color, within and without. I cannot help feeling impressed when I look at the figures of the Naiades of Lake Tanganyika that from some cause many of them are more or less diseased and that the shells in such cases are somewhat distorted or abnormal. And I am inclined to believe that Bourguignat and other authors of the new school have selected these diseased, distorted shells and made of them types of species.

This appears to be a valid genus, belonging to the *Mutelidæ*. I copy for the most part Bourguignat's description, which leaves out some essential characters. I have never seen any of the species.

KEY TO SPECIES OF BRAZZÆA.

Umbonal region much elevated and inflated.	
Shell long, rhomboid elliptical, wider than high.	*bourguignati.*
Shell short, height greater than the width.	*ventrosa.*
Umbonal region but little inflated.	
Shell obovate, short.	*coulboisi.*
Shell long elliptical.	*elongata.*
Umbonal region not elevated.	*anceyi.*

BRAZZÆA ANCEYI Bourguignat.

Shell irregularly elliptical or subrhomboid, inflated, slightly inequivalve, somewhat inequilateral, thin; beaks not raised above the dorsal line, flattened; dorsal line straight, winged a little in front and behind; anterior end rounded, angled above; base line curved, fullest behind the middle; posterior ridge faintly double, curved downward in the middle, ending in a biangulation at and below the median line; dorsal slope obliquely truncate; surface concentrically striate; splendid violet wine color, shining, with blackish violet margins; interior colored as the exterior; left valve projecting over the right in a somewhat sinuous wing.

Length 66, height 47, diam. 36 mm.

Lake Tanganyika.

Brazzæa anceyi BOURGUIGNAT, Esp. Ouk. et Tan., 1885, p. 33; Icon., 1888, pl. XXVIII, figs. 1-4.—SIMPSON, Syn., 1900, p. 907.

Brazzea anceyi GERMAIN, Arch. Zool. Exp. et Gen., (5), I, 1909, pp. 52, 57.

Brazzæa eximia BOURGUIGNAT, Un. and Ir. Tan., 1886, p. 57; Icon., 1888, pl. XXIX, fig. 5.

This must be a magnificent shell according to the description of its author.

Germain, (l. c.), refers all of Bourguignat's species to this as synonyms.

BRAZZÆA BOURGUIGNATI Bourguignat.

Shell irregularly subrhomboid, slightly inequivalve and inequilateral, subsolid, greatly inflated; beaks somewhat elevated, elongated and much swollen; dorsal outline straight, ending in a low wing behind; anterior end irregularly rounded, subangulate above, cut away below; base straight but full behind the middle; posterior ridge double, ending in a biangulation at and below the median line; dorsal slope obliquely truncate; surface concentrically striate, opake blackish-violet, lighter at the beaks; valves brilliant; nacre violet-wine-color, splendidly iridescent.

Length 60, height 32, diam. 36 mm.

Lake Tanganyika.

Brazzæa bourguignati BOURGUIGNAT, Un. and Ir. Tan., 1886, p. 58; Icon., 1888, pl. XXVIII, figs. 5, 6.—SIMPSON, Syn., 1900, p. 907.

This seems to be one of the few Naiades, whose diameter is greater than the height. The beaks of this species are elevated above the dorsal line and are much more swollen than in *B. anceyi,* and the shell is more elongated.

Said by Bourguignat to be of Joubert *in litt.*

BRAZZÆA ELONGATA Bourguignat.

Shell irregularly long elliptical, somewhat inflated, subsolid, opake, inequilateral, bihiant; beaks full; dorsal outline curved; anterior end narrowed, rounded, slightly angled above; base line much and evenly curved; posterior ridge well developed, decidedly double, ending in a well-marked biangulation behind, the region above it very slopingly truncate, surface concentrically striate, subviolaceous chestnut, becoming pale yellowish white or violaceous at the beaks; nacre whitish, the margins pale violet.

Length 78, height 42, diam. 34 mm.

Lake Tanganyika.

Brazzæa elongata BOURGUIGNAT, Un. and Ir. Tan., 1886, p. 51; Icon., 1888, pl. XXIX, figs. 2, 3.—SIMPSON, Syn., 1900, p. 907.

Less inflated and more evenly elliptical than the preceding species. The color externally and internally is different.

BRAZZÆA COULBOISI Bourguignat.

Shell somewhat obovate, subinflated, scarcely inequilateral, subsolid; dorsal outline arched, most produced at the rather full beaks; anterior end narrowed, rounded; base curved, quite full behind the middle; posterior ridge double, ending in a biangulation at and below the median line; dorsal slope obliquely truncate; surface subopake, violet-blackish; nacre splendid violet wine-color, with metallic, silvery iridescence.

Length 62, height 44, diam. 28 mm.

Lake Tanganyika.

Brazzæa coulboisi BOURGUIGNAT, Un. and Ir. Tan., 1886, p. 50; Icon., 1888, pl. XXIX, fig. 1.—SIMPSON, Syn., 1900, p. 907.

The figure shows this shell to be somewhat obovate and but little elongated. Bourguignat states that it is bihiant.

BRAZZÆA VENTROSA Bourguignat.

Shell scarcely subsolid, greatly inflated, short, scarcely inequilateral, inequivalve, bihiant; beaks low, but the umbonal region is greatly swollen so that the outline of the shell from an end view is heart-shaped; dorsal line nearly straight; anterior end evenly rounded; base curved; posterior end beaked; surface violet-chestnut; nacre uniform violet wine-color, brilliantly iridescent.

Length 64, height 41, diam. 37 mm.

Lake Tanganyika.

Brazzæa ventrosa BOURGUIGNAT, Un. and Ir. Tan., p. 45; Icon., 1888, pl. XXIX, fig. 4.—SIMPSON, Syn., 1900, p. 907.

This species should be distinguishable by the immense, rounded umbonal region, the beaks themselves being flattened.

The following are unfigured species:

Brazzæa randabeli BOURGUIGNAT, Un. and Ir., 1886, p. 46.
Brazzæa moineti BOURGUIGNAT, Un. and Ir., 1886, p. 47.
Brazzæa jourdyi BOURGUIGNAT, Un. and Ir., 1886, p. 48.
Brazzæa charbonnieri BOURGUIGNAT, Un. and Ir., 1886, p. 52.
Brazzæa lavigerina BOURGUIGNAT, Un. and Ir., 1886, p. 53.
Brazzæa bridouxi BOURGUIGNAT, Un. and Ir., 1886, p. 54.
Brazzæa newcombiana BOURGUIGNAT, Un. and Ir., 1886, p. 55.

All from Lake Tanganyika.

Genus ARTHROPTERON Rochebrune.

Arthropteron ROCHEBRUNE, Bull. Mus. Hist. Nat., 1904, p. 460.

"Shell ovoid, somewhat thick, quite inflated, abruptly rounded in front, subelongate behind, edentulous; umbones subcontiguous, small; ligament long, curved, partly covered; in the region behind the beaks forming an area like a pen, concave, elongated, longitudinally minutely striate, striæ occasionally interrupted; muscular impressions feeble.

This genus is characterized by an area situated behind the beaks, in the form of a pen, long elliptical in shape, deeply channeled, subangulated, with fine longitudinal striæ, somewhat interrupted, the widest part is near the beaks, from whence it decreases in size, becoming pointed at the point of contact with the posterior margin." (Rochebrune).

Type, *Arthropteron ouassouloui* Rochebrune.

ARTHROPTERON OUASSOULOUI Rochebrune.

"Shell ovoid, rather thick, inequilateral, somewhat gaping below and behind; pale olivaceous-yellow, irregularly striate, subfoliaceous sulcate posteriorly; dorsal margin convex in front, straight behind; anterior end rather wide, obtuse; posterior rounded, slightly narrow; beaks contiguous, small, obtuse, eroded, situated at 1-3 of the length, area not conspicuous; ligament long, somewhat prominent; nacre pearly, white, here and there rosy-blue.

Length 69, height 41, diam. 25 mm." (Rochebrune).

Type locality, Region of Ouassoulou, French Soudan.

Arthropteron ouassouloui ROCHEBRUNE, Bull. Mus. Hist. Nat., 1904, p. 461, fig. 1.

Arthropteron ouassoulouensis GERMAIN, Arch. Zool. Exp. et Gen., (5), I, 1909, p. 52, fig. 44.

Genus PLEIODON Conrad, 1854.

Pleiodon CONRAD, Jl. Ac. N. Sci. Phila., VII, 1834, p. 178.

Shell elliptical, inflated, solid, with a rounded posterior ridge, and full, smooth beaks; epidermis smooth, shining, generally rayless; hinge plate wide, nearly straight, set with strong, irregular, taxodont teeth throughout its length; beak cavities moderate, with a row of dorsal scars running obliquely downward and forward; anterior and posterior muscle scars well defined.

Animal with the palpi semilunar, united to the mantle by a straight border, longer than wide; outer gills generally larger than the inner, united their whole length to the mantle;

inner united to the abdominal sac; genitalia ocupying each side the lateral part of the visceral mass as far forward as the foot; mantle closed below the branchial siphon, and united into branchial and anal siphons; anal opening rather small; branchial large, separated by a solid bridge, which solders together the extremities of the four branchiæ; both orifices have a thickened inner edge; the branchial being furnished with short tubercles or granules; mantle united below posteriorly one-fourth its length; foot large and strong; adductor muscles strong. (Pelseneer.)

Type, *Iridina ovata* Swainson.

In this small group the taxodont teeth, which are more or less characteristic of the Mutelidæ, are strongly developed. I have used the name *Cameronia* of Bourguignat in a subgeneric sense.

Subgenus PLEIODON s. s.

Characters as in the genus.

PLEIODON OVATUS (Swainson).

Shell generally irregularly obovate, subinflated, solid, slightly inequilateral; beaks full and high; posterior ridge rounded, ending in a rounded point about on the median line, above it there is a radial, shallow excavation or furrow, which sometimes ends in a light sinus at the obliquely truncate margin of the dorsal slope; dorsal outline lightly arched, anterior end a little narrowed, rounded, often subangulate above; base line curved, fullest behind the middle; surface nearly smooth, concentrically striate and having indications of radial sculpture; epidermis dark olive-green, lighter at the beaks; hinge with numerous, irregular, taxodont teeth, the anterior ones oblique, the posterior ones somewhat V-shaped; dorsal scars forming irregular rows running from the beaks towards the anterior base; muscle scars lightly impressed; nacre whitish to pale violet, sometimes greenish, often brilliantly iridescent.

Length 114, height 64, diam. 37 mm.

Length 105, height 64, diam. 42 mm.

West Africa.

Iridina ovata SWAINSON, Phil. Mag., LXI, 1823, p. 112.—REEVE, Conch. Syst., I, 1841, p. 122, pl. XCIII; Elements of Conch., II, 1860, pl. XXXIII, fig. 184.—CLESSIN, Conch. Cab. Ano., 1875, p. 230, pl. LXX, fig. 2; LXXI, fig. 2.

Platiris (Iridina) ovata LEA, Syn., 1838, p. 33; 1852, p. 54; 1870, p. 88.

Pleiodon ovata CONRAD, Jl. Ac. Nat. Sci. Phila., VII, 1854, p. 298.

Pleiodon ovatus CHENU, Man., 1859, II, p. 148, fig. 728.—SOWERBY, Conch. Icon., XVI, 1866, pl. I, fig. I.—SIMPSON, Syn., 1900, p. 908.

Pliodon ovatus GERMAIN, Arch. Zool. Exp. et Gen., (5), I, 1909, p. 59.

Iridina exotica CHILDREN, Brande's Jl., XV, 1823, p. ?

Pleiodon macmurtriei CONRAD, Jl. Ac. Nat. Sci. Phila., VII, 1834, p. 13, pl. XIII.

Margarita (Pleiodon) macmurtriei LEA, Syn., 1836, p. 55.

Iridina valeus JAY, Cat., 1850, p. 70.

Mutela valeus H. and A. ADAMS, Gen. Rec. Moll., II, 1857, p. 506.

Platiris (Iridina) leaii LEA, Syn., 1852, p. 54; 1870, p. 88.

Pleiodon leaii H. and A. ADAMS, Gen. Rec. Moll. II, 1857, p. 506.

Pleiodon splendens CONRAD, Jl. Ac. Nat. Sci. Phila., VII, 1854, p. 299.

Iridina splendida CHENU, Ill. Conch., 1858, pl. V, figs. 2, *2a, 2b, 2c, 2d*.

A well-known and abundant species. The hinge is strong and flat, the teeth are very numerous and extend its whole length. At the beaks the hinge plate is narrow, the teeth in front of and behind them for some distance are narrow and somewhat radial; at the hinder part of the hinge they become more or less V-shaped. The shell is less elongated than that of *P. laudeaui*.

Var. *pachyodon* Bourguignat.

Pleiodon pachyodon BOURGUIGNAT, Moll. Egypt and Ab., 1870, p. 43.—SIMPSON, Syn., 1900, p. 909.

Pliodon ovatus var. *pachyodon* GERMAIN, Arch. Zool. Exp. et Gen., (5), I, 1909, pp. 44, 59, fig. 41.

This form from Le Bafing, Senegal, characterized by its exceedingly heavy hinge, Germain, (l. c.), considers worthy of varietal rank.

Subgenus CAMERONIA Bourguignat, 1879.

Cameronia BOURGUIGNAT, Moll. Egypt and Ab., 1879, p. 42.

Anterior end of the hinge plate usually (not always) split up lengthwise into irregular teeth, which bear tubercles on their surfaces.

The mantle of *P. spekii* has a decided pallial sinus behind. (Pelseneer.)

Type, *Iridina spekii* Woodward.

PLEIODON SPEKII Woodward.

Shell elongated, solid, somewhat variable in form, long elliptical, long ovate or slightly obovate, more or less inflated, inequilateral; beaks full, elevated and elongated; posterior ridge rounded; dorsal outline arched; anterior end rounded, sometimes narrowed and subangulate above; base straight, curved or lightly incurved medially; posterior end usually bluntly pointed; surface nearly smooth; epidermis dark chestnut to reddish-brown, somewhat shining; hinge with irregular, taxodont teeth, the anterior part having cross teeth; muscle scars well marked; nacre whitish to violet, brilliant.

Length 120, height 50, diam. 45 m.

Length 141, height 67, diam. 45 mm.

Length 107, height 44, diam. 41 mm.

Lake Tanganyika.

Iridina (Pleiodon) spekii WOODWARD, Pr. Zool. Soc. Lond., 1859, p. 348, pl. XLVII, fig. 2.

Pleiodon spekii SOWERBY, Conch. Icon., XVI, 1866, pl. 1, fig. 2.

Platiris (Iridina) spekii LEA, Syn., 1870, p. 88.

Cameronia spekii BOURGUIGNAT, Moll. Egypt and Ab., 1879, p. 43.

Iridina spekii CLESSIN, Conch. Cab. Ano., 1875, p. 232, pl. LXX, fig. 2.

Pleiodon (Cameronia) spekii CROSSE, Jl. de Conch., XXIX, 1881, p. 130.

Pleiodon spekii SMITH, Proc. Zool. Soc., 1881, p. 296, pl. XXXIV, figs. 31, 31*a*.—SIMPSON, Syn., 1900, p. 909.

Mutela (Iridina) spekii VON MARTENS, Besch., 1897, p. 256.

Pliodon (Cameronia) spekei GERMAIN, Moll. L. Tan., 1908, p. 83.

Pliodon spekei GERMAIN, Arch. Zool. Exp. et Gen., (5), I, 1909, p. 59.

Cameronia gigantea BOURGUIGNAT, Un. and Ir., 1886, p. 68; Icon. Mal., 1888, pl. XXXV, fig. 1.

Cameronia admirabilis BOURGUIGNAT, Un. and Ir., 1886, p. 69; Icon. Mal., 1888, pl. XXXIV, fig. 1.

Cameronia coulboisi BOURGUIGNAT, Un. and Ir., 1886, p. 77; Icon. Mal., 1888, pl. XXXI, figs. 1, 2.

Cameronia josseti BOURGUIGNAT, Un. and Ir., 1886, p. 82; Icon. Mal., 1888, pl. XXXII, fig. 3.

Cameronia paradoxa BOURGUIGNAT, Un. and Ir., 1886, p. 91; Icon. Mal., 1888, pl. XXXII, fig. 1.

Cameronia bridouxi BOURGUIGNAT, Un. and Ir., 1886, p. 71.

Pliodon (Cameronia) bridouxi GERMAIN, Moll. L. Tan., 1908, p. 84, figs. 43, 44.

All the specimens of *Cameronia* I have seen seem to be more or less diseased and therefore quite variable in form. The group has apparently furnished Bourguignat with a capital opportunity to found a great number of so-called species on every possible trivial variation and deformity.

PLEIODON LANDEAUI (Bourguignat).

Shell subelliptical or subrhomboid, not much elongated, somewhat inflated, solid, slightly inequilateral; beaks high, long and full; dorsal outline arched, most produced at the beaks; anterior end narrowed, rounded, angled above; base line curved; posterior end obliquely truncate above, rounded below; surface concentrically striate; margins dark chestnut; beaks greenish, the rest of the shell yellowish-chestnut; nacre splendidly white and iridescent; teeth irregular and continuing more or less throughout the hinge.

Length 92, height 48, diam. 35 mm.

Lake Tanganyika.

Cameronia landeaui BOURGUIGNAT, Un. and Ir., 1886, p. 74; Icon. Mal., 1888, pl. XXXI, fig. 3.

Pleiodon landeaui SIMPSON, Syn., 1900, p. 909.

Less elongate than *P. spekii* and having the dorsal line more arched.

PLEIODON BOURGUIGNATI (Bourguignat).

Shell much elongated, very solid, inflated, inequilateral; beaks and umbonal region full, high and elongated; dorsal and basal outlines lightly curved; anterior and posterior ends almost evenly rounded, the latter a little the wider; surface roughly, concentrically striate, almost black; valves gaping at the anterior base; nacre rosy white, brilliantly iridescent; hinge plate wide and flat, having a few, irregular, strong, nearly vertical teeth behind the beaks and three or four small tubercles in front of them; muscle scars large and deep.

Length 130, height 51.5, diam. 48 mm.

Lake Tanganyika.

Cameronia bourguignati BOURGUIGNAT, Esp. Ouk., 1885, p. 26; Icon. Mal., 1888, pl. XXXIII.

Pleiodon bourguignati SIMPSON, Syn., 1900, p. 909.

Apparently a very good species. In outline it is almost evenly long elliptical, the beaks are very prominent, the surface black and the epidermis somewhat shaggy behind. Very solid, with a wide hinge plate and a few strong teeth.

Credited to Ancey *in litt.* by Bourguignat.

PLEIODON GIRAUDI (Bourguignat).

Shell elongate-ovate, inflated, thick, solid, gaping anteriorly, lightly striate, shining, blackish-brown, reddish-brown towards the umbones; dorsal margin straight, oblique; anterior margin rounded, somewhat cut away below; basal margin slightly incurved; posterior end extended in a very obtuse, rounded beak; umbonal region greatly inflated; beaks very prominent,

recurved; anterior portion of the hinge edentulous, posterior lamella elongate, obtuse, narrow and serrate with obtuse tubercles; nacre white, tinged with rose, bluish towards the margins.

Length 119, height 55, diam. 45 mm.

Type locality, Mpala, Lake Tanganyika.

Cameronia giraudi Bourguignat, Not. Prod., 1885, p. 107.—Simpson, Syn., 1900, p. 910.

Pliodon (Cameronia) giraudi Germain, Moll. L. Tan., 1908, p. 85, figs. 47, 48.

Cameronia charbonnieri Bourguignat, Un. and Ir., 1886, p. 83.—Simpson, Syn., 1900, p. 909.

Pliodon (Cameronia) charbonnieri Germain, Moll. L. Tan., 1908, p. 85, figs. 45, 46.

Cameronia lavigeriana Bourguignat, Un. and Ir., 1886, p. 85.

Cameronia lavigerina Simpson, Syn., 1900, p. 910.

Cameronia lavigeriei Germain, Moll. L. Tan., 1908, p. 87.

Germain, (l. c.), figures the types of *giraudi* and *charbonnieri* and considers them synonymous. He also unites with them *C. lavigeriana* Bgt. as a mutation "characterized by the great development of the rostral part."

PLEIODON VYNCKEI (Bourguignat).

Shell oblong, acutely rostrated at the lower posterior extremity, somewhat incurved in the middle of the basal margin; thick, opaque, shining; quite heavily striate; black, brown towards the umbones; nacre pale rose-color, whitish and very iridescent at the margins; valves gaping at both ends, greatly inflated, especially in the umbonal region; dorsal margin curved; anterior end rounded; basal margin straight; posterior end arcutely rostrate; umbones anterior, prominent, much inflated, but laterally compressed anteriorly; cardinal tooth thick, nearly obsolete; lateral tooth strong, elongate, thick, serrate.

Length 134, height 61, diam. 50 mm.

Type locality, Lake Tanganyika.

Cameronia vynckei Bourguignat, Un. and Ir., 1886, p. 81.

Cameronia vynckii Simpson, Syn., 1900, p. 910.

Pliodon (*Cameronia*) *vynckei* GERMAIN, Moll. L. Tan., 1908, p. 87, figs. 49, 50, 51.

"This species is principally characterized by its short, more or less subtrigonal form, much developed in height, and by its prominent, well-inflated, nearly central beaks. The dorsal margin is distinctly curved in a direction slightly ascending; anterior end rounded; basal margin subconvex, slightly incurved in the centre; posterior end twice as long as the anterior and prolonged into a beak that is almost basal. The shell is thick, solid, heavy, quite strongly striate; epidermis a brilliant, deep brown; nacre roseate, slightly bluish at the margins." (Germain).

PLEIODON TCHADIENSIS Germain.

"Shell large, very elongate-oblong; valves moderately inflated, very thick and heavy; dorsal margin slightly convex as far as the postero-dorsal angle; ventral margin medially incurved, nearly parallel to the dorsal margin; anterior region moderate, semi-elliptical; posterior region well developed, more than twice as long as the anterior, terminating in a short point, slightly elevated; dorsal ridge moderate, very obtuse; beaks obtuse, much compressed, not prominent, eroded, showing a beautiful, very iridescent, bluish nacre; muscular impressions deep; hinge scarcely denticulated in front, strongly denticulated posteriorly. Epidermis dark chestnut; lines of growth quite strong and irregular nacre salmon-rose, remarkably iridescent.

Length 160, height 62.5 mm. at 66 mm. from the beaks, diam. 39 mm." (Germain).

Type locality, Lake Tchad.

Pliodon (Cameronia) tchadiensis GERMAIN, Bull. Mus. Hist. Nat., 1905, p. 489; Ibid, 1906, p. 60, fig. 4; l'Afrique Cent. Fr., 1907, p. 578, fig. 98.

PLEIODON HARDELETI Germain.

"Shell much elongated, slightly wedge-shaped; valves quite inflated, thick and solid; dorsal and ventral margins divergent; dorsal margin subconvex, slightly ascending; ventral nearly straight, slightly incurved in the middle; anterior end short; posterior end very long, almost three and one-half times as long as the anterior, terminating in a short, oblique point; beaks quite obtuse, much depressed; muscular impressions deep; hinge irregularly dentate, denticulations stronger posteriorly. Epidermis dark chestnut, passing into black towards the anterior and ventral margins; lines of growth moderate and irregular; nacre very bright rose-salmon, very iridescent.

Length 105, height 43.5 at 39 mm. from the beaks, diam. 28 mm." (Germain).

Type locality, Lake Tchad.

Pliodon (Cameronia) hardeleti Germain, Bull. Mus. Hist. Nat., 1905, p. 489; Ibid, 1906, p. 56, fig. 2; l'Afrique Cent. Fr., 1907, p. 577, fig. 99.

Var. *molli* Germain.

"This variety differs from the type: By its more regularly elongate oval shape; by its dorsal margin being nearly straight, slightly ascending, and nearly parallel to the ventral margin, (in the typical form the dorsal and ventral margins are very divergent); by the less decidedly truncate posterior end, etc.

Length 105, height at 44 mm. from the beaks 38, diam. 26 mm." (Germain).

Type locality, Lake Tchad.

Pliodon (Cameronia) hardeleti var. *molli* Germain, Bull. Mus. Hist. Nat., 1906, p. 58, fig. 3; l'Afrique Cent. Fr., 1907, p. 578, fig. 100.

The following are unfigured species of *Cameronia*:

Cameronia anceyi Bourguignat, Esp. Ouk., 1885, p. 30.
Cameronia complanata Bourguignat, Un. and Ir., 1886, p. 76.
Cameronia dromauxi Bourguignat, Un. and Ir., 1886, p. 84.
Cameronia guillemeti Bourguignat, Un. and Ir., 1886, p. 72.
Cameronia jouberti Bourguignat, Un. and Ir., 1886, p. 88.
Cameronia locardiana Bourguignat, Un. and Ir., 1886, p. 78.
Cameronia marioniana Bourguignat, Esp. Ouk., 1885, p. 28.
Cameronia mabilliana Bourguignat, Un. and Ir., 1886, p. 86.
Cameronia moineti Bourguignat, Un. and Ir., 1886, p. 89.

Cameronia pulchella Bourguignat, Un. and Ir., 1886, p. 73.
Cameronia obtusa Bourguignat, Un. and Ir., 1886, p. 75.
Cameronia randabeli Bourguignat, Un. and Ir., 1886, p. 90.
Cameronia revoiliana Bourguignat, Moll. Tan., 1885, p. 107.

All from Lake Tanganyika.

Genus MONOCONDYLÆA d'Orbigny, 1835.

Aplodon Spix (not of Rafinesque, 1818), Test. Fluv. Bras., 1827, pl. xxv, figs. 1, 2.
Monocondylæa d'Orbigny, Guerin Mag., 1835, p. 37.
Spixoconcha Pilsbry, Naut., VII, 1893, p. 30.

Shell rounded to obovate, rather solid, with a low, posterior ridge, which is generally bordered by two or more dark, radiating bands; epidermis dull olive-green to olive-brown, cloth-like; hinge with two irregular teeth under the beak in the left valve, and two in the right, the posterior under the beak, the anterior in front of it and interlocking with those of the left valve, the whole generally more or less tuberculate; nacre soft, silvery, with iridescent shades; anterior scars united; posterior indistinct; prismatic layer wide.

Animal with the marsupium occupying the whole length of the inner branchiæ; gills very large, curved below, inner very much the larger, united the whole length of the abdominal sac; palpi small, round below, attached along their upper edge; mantle thick, greatly thickened at the edge, with a few papillæ in front of the branchial opening below; branchial opening large, with numerous small knob-like papillæ; anal opening large, without papillæ, separated completely from the branchial opening by a bridge; superanal opening not closed below.

Type, *Monocondylæa paraguayana* d'Orbigny.

In *Monocondylæa* the teeth are imperfect, there being usually a single rounded tooth in the left valve often with a pit behind it and one tooth in the right valve, or frequently there is a smaller one in front of it with pit between. In *M. reticulata* the teeth are very irregular and somewhat broken up into denticles.

KEY TO SPECIES OF MONOCONDYLÆA.

Shell more or less roughly, concentrically sculptured.	
Surface with crenate striæ.	*reticulata.*
Surface squamose, rasp-like.	*jaspidea.*
Shell more or less radially sculptured.	
With strong radial ribs throughout.	*costulata.*
With radial depressions in front of the posterior ridge.	*guarayana.*
Shell smooth or lightly concentrically striate.	
Nearly orbicular.	*franciscana.*
Obovate, green, convex.	*lentiformis.*
Elliptical.	
Solid, subtruncate at dorsal slope.	*corrientesensis.*
Rather thin, rounded behind.	*inermis.*
Subrhomboid or subquadrate.	
Short, almost squarely truncate behind.	*minuana, paraguayensis.*
Long rhomboid, obliquely truncate behind.	*parchappi.*

Group of *Monocondylæa guarayana.*

Shell obovate, inflated, solid, solid, often slightly produced just behind the center of the base; beaks full, turned inward and forward.

MONOCONDYLÆA GUARAYANA d'Orbigny.

Shell oval, inflated, very solid, inequilateral; beaks full and elevated, somewhat pointed; dorsal outline arched; anterior end rounded; base line curved in front, slightly emarginate in front of the posterior ridge; posterior ridge imperfectly double, ending near the base of the shell in a narrow biangulation; in front of it are two shallow, wide, radial depressions; dorsal slope obliquely truncate; epidermis brown or yellowish-brown; each valve has a single, rounded, subcompressed tooth, that of the right valve largest; nacre apparently salmon.

Length 40, height 29, diam. 24 mm.

Bolivia.

Monocondylæa guarayana d'ORBIGNY, Guer. Mag., 1835, p. 38; Voy. Am. Mer., 1843, p. 614, pl. LXVIII, figs. 4-5.—H. and A. ADAMS, Gen. Rec. Moll., II, 1857, p. 501; III, pl. CXVII, fig. 3.—CHENU, Man., 1859, II, p. 145, fig. 715.—SIMPSON, Syn., 1900, p. 910.

Margarita (Monocondylæa) guarayana LEA, Syn., 1838, p. 28.

Unio guarayana HANLEY, Biv. Shells, 1843, p. 213, pl. XXII, fig. 14.—SOWERBY, Conch. Icon., XVI, 1868, pl. XCVI, fig. 524.

Margaron (Monocondylæa) guarayana LEA, Syn., 1852, p. 45; 1870, p. 73.

This species is somewhat oval in outline, and is distinguished by having two curved, radial depressions in each valve in front of the posterior ridge.

MONOCONDYLÆA INERMIS (Spix).

Shell small, evenly elliptical, rather thin, slightly inequilateral; beaks full and elevated, apparently having a short, deep lunule in front of them; surface yellowish-green; nacre purplish or pinkish-tinted; hinge line delicate; teeth small and compressed.

Length 21, height 16.5 mm.

South Brazil.

Aplodon inerme SPIX, Test. Fluv. Bras., 1827, p. 32, pl. XXV, figs. 1-2.—VON IHERING, Arch. für Nat., 1890, p. 126, pl. IX, figs. 1-3.

Monocondylæa inerme SIMPSON, Syn., 1900, p. 911.

I have never seen this species and Wagner merely mentions it with a few words of description. The figures, however, are good, probably taken from a young shell, and show that it is provided with a single, somewhat compressed tooth in each valve. The above measurements are from these figures.

MONOCONDYLÆA PARCHAPPII d'Orbigny.

Shell singularly long rhomboid, compressed to convex, solid, concentically striate, inequilateral; beaks prominent, rather sharp, turned forward; dorsal outline arched; anterior end rounded; base nearly straight; posterior end obliquely truncate; epidermis brownish-green; nacre bluish to rose-color; tooth of the left valve conical, rounded, that of the right low.

Length 47, height 28, diam. 19 mm.

Argentina.

Monocondylæa parchappii d'ORBIGNY, Guer. Mag., 1835, p. 38; Voy. Am. Mer., 1843, p. 615, pl. LXVIII, figs. 1-3.—SIMPSON, Syn., 1900, p. 911.

Margarita (Monocondylæa) parchappii LEA, Syn., 1838, p. 28.

Unio parchappii HANLEY, Biv. Shells, 1843, p. 212, pl. XXII, fig. 13.

Margaron (Monocondylæa) parchappii LEA, Syn., 1852, p. 45; 1870, p. 73.

Monocondylæa pazii LEA, Pr. Ac. N. Sci. Phila., X, 1866, p. 34; Jl. Ac. N. Sci. Phila., VI, 1868, p. 273, pl. XXXVI, fig. 88; Obs., XII, 1869, p. 36, pl. XXXVI, fig. 88.—CLESSIN, Conch. Cab. Ano., 1876, p. 251, pl. LXXIX, figs. 6-7.

Margaron (Monocondylæa) pazii LEA, Syn., 1870, p. 73.

Decidedly rhomboid in outline and much more compressed than *guarayana*. Besides, it lacks the radial furrows of that species.

MONOCONDYLÆA PARAGUAYANA d'Orbigny.

Shell subquadrate or subrhomboid, solid, inflated, inequilateral, concentrically striate; beaks full and high; dorsal line behind them nearly straight; posterior end almost squarely truncate; anterior end rounded, narrowed; base curved, fullest behind the middle; above the posterior ridge there seems to be a couple of radial furrows; epidermis brown-green; nacre pale greenish, brilliantly iridescent; tooth of the left valve obtuse and nearly triangular.

Length 59, height 44, diam. 32 mm.

Rio de la Plata drainage.

Monocondylæa paraguayana d'ORBIGNY, Guer. Mag., 1835, p. 37.—SOWERBY, Conch. Man., 1839, fig. 149.—d'ORBIGNY, Voy. Am. Mer., 1843, p. 612, pl. LXX, figs. 5-7.—CLESSIN, Conch. Cab. Ano., 1876, p. 245, pl. LXXVIII, figs. 1, 2.—SIMPSON, Syn., 1900, p. 911.

Margarita (Margaritana) paraguayana Lea, Syn., 1838, p. 27.

Unio paraguayana Hanley, Biv. Shells, 1843, p. 212, pl. xxii, fig. 17.—Sowerby, Conch. Icon., XVI, 1866, pl. lii, fig. 273.

Margaron (Monocondylæa) paraguayana Lea, Syn., 1852, p. 45; 1870, p. 73.

Unio paraguayanus Catlow and Reeve, Conch. Nom., 1845, p. 62.

A large, solid, subquadrate species, with brilliantly iridescent nacre, of which *M. minuana* is, perhaps, but the young. There are often two faint, green rays on the dorsal slope of each valve.

Monocondylæa minuana d'Orbigny.

Shell irregularly rhomboid, convex or subinflated, solid, concentrically striate, inequilateral; beaks quite prominent, turned inward and forward; posterior ridge rounded; dorsal line behind the beaks nearly straight; anterior end narrowed and rounded; base lightly curved; posterior end obliquely truncate; epidermis greenish; nacre pale greenish or tinted with reddish; tooth of the left valve roughened.

Length 46, height 28, diam. 20 mm.

Rio de la Plata drainage.

Monocondylæa minuana d'Orbigny, Guer. Mag., 1835, p. 37; Voy. Am. Mer., 1843, p. 612, pl. lxx, figs. 8-10.

Margarita (Margaritana) minuana Lea, Syn., 1838, p. 28.

Margaron (Monocondylæa) minuana Lea, Syn., 1852, p. 45; 1870, p. 73.

Unio minuanus Hanley, Biv. Shells, 1843, p. 213, pl. xxii, fig. 18.—Sowerby, Conch. Icon., XVI, 1868, pl. xci, fig. 497.

Monocondylæa paraguayana, (part), Simpson, Syn., 1900, p. 911.

I formerly believed that this species was the same as *paraguayana,* being only the young of it. It is however more elongated, and, perhaps, less inflated than that. The dorsal slope is more obliquely truncated.

MONOCONDYLÆA RETICULATA Moricand.

Shell subelliptical or subrhomboid, somewhat inflated, subsolid, inequilateral; beaks high and full, turned forward over a sort of lunule; dorsal outline behind the beaks arched; posterior end obliquely truncate or subtruncate; anterior end narrowed and rounded, angled above; base curved; surface having irregular, concentric striæ, which appear as if reticulated; epidermis cloth-like; nacre bluish-white; teeth more or less broken up, subnodulous.

Length 40, height 30, diam. 21 mm.

Brazil.

Monocondylæa reticulata MORICAND, Rev. et Mag., X, 1858, p. 453, pl. XV, fig. 2.—SIMPSON, Syn., 1900, p. 912.

Margaron (Monocondylæa) reticulata LEA, Syn., 1870, p. 72.

Margaritana reticulata PÆTEL, Conch. Sam., III, 1890, p. 173.

Unio reticulatus SOWERBY, Conch. Icon., XVI, 1868, pl. LXXXVI, fig. 458.

Aplodon reticulatus VON IHERING, Arch. für Nat., 1893, p. 115.

Something like *M. paraguayana,* but lacking the posterior green rays and the surface is subreticulated, while in that species it is not.

MONOCONDYLÆA COSTULATA Moricand.

Shell irregularly ovate, inflated, inequilateral, with full, rounded, elevated beaks; dorsal line behind the beaks and dorsal slope curved, a little more prominent behind the ligament; anterior end somewhat narrowed, rounded; base curved, but emarginate behind the middle at the termination of a shallow, radial furrow; posterior ridge rounded, ending near the base of the shell in a blunt, rounded point; surface with narrow, radiating ribs; epidermis dark olive; nacre bluish-white; there is a single, thick, primary tooth in each valve.

Length 34, height 22 mm.

Brazil.

Monocondylæa costulata MORICAND, Rev. et Mag. Zool., X, 1858, p. 453, pl. XV, fig. 1.—SIMPSON, Syn., 1900, p. 912.

Unio costulatus SOWERBY, Conch. Icon., XVI, 1868, pl. LXXXVIII, fig. 470.

Margaron (Monocondylæa) costulata LEA, Syn., 1870, p. 72.

This seems to differ decidedly from any form I am acquainted with. The ovate outline and radial ribs are excellent distinguishing characters.

MONOCONDYLÆA CORRIENTESENSIS d'Orbigny.

Shell irregularly short elliptical, convex, rather solid, inequilateral; beaks almost compressed, slightly elevated; dorsal outline arched, subangulate where it joins the obliquely truncate or subtruncate dorsal slope; anterior end narrow, rounded; base line much rounded; posterior ridge rounded, ending in a point above the base line; surface irregularly striate; epidermis greenish-olive with two or three feeble, green rays on the posterior part; nacre bluish-white, iridescent; muscle scars impressed; teeth small, stumpy, single in each valve.

Length 44, height 33, diam. 21 mm.

Argentina.

Monocondylæa corrientesensis d'ORBIGNY, Guer. Mag., 1835, p. 38; Voy. Am. Mer., 1843, p. 615, pl. LXVII, figs. 8-10.—CLESSIN, Conch. Cab. Ano., 1876, p. 246, pl. LXXVIII, figs. 3, 4.—SIMPSON, Syn., 1900, p. 912.

Margarita (Monocondylæa) corrientesensis LEA, Syn., 1838. p. 28.

Unio corrientesensis HANLEY, Biv. Shells, 1843, p. 212, pl. XXII, fig. 15.—SOWERBY, Conch. Icon., XVI, 1868, pl. XCIII, fig. 509.

Margaron (Monocondylæa) corrientesensis LEA, Syn., 1852. p. 45; 1870, p. 73.

More elliptical than *reticulata,* not so much inflated, and not having the reticulated surface of that species.

MONOCONDYLÆA JASPIDEA (Hupé).

Shell subtrapezoid, compressed, subequilateral, solid; beaks moderately full and high; dorsal outline somewhat arched, subangular where it joins the obliquely truncate posterior end; anterior end narrow, rounded; base curved; surface covered with squamose striæ giving it the appearance and roughness of a rasp; epidermis a tender green with small angular, jasper-colored spots; hinge thick, having two teeth, one of which is smaller than the other; nacre white, pearly.

Length 20, height 15, diam. 3 mm.

Amazon.

Unio jaspidea HUPÉ, An. Nouv., III, 1857, p. 83, pl. XVII, fig. 2.

Margaron (Unio?) jaspideus LEA, Syn., 1870, p. 37.

Monocondylæa jaspidea SIMPSON, Syn., 1911, p. 912.

Hupe calls this a *Unio,* but from his description and figure I think it is a *Monocondylæa.* The remarkably rough, rasp-like surface, colored green, with small, angular jasper-colored spots distinguish it from all other species. Hupe gives the diameter as 3 millimeters, which may be an error as this would make a most remarkably compressed shell. It may be that it should have been 8 millimeters.

Group of *Monocondylæa franciscana.*

Shell moderately inflated, lenticular, rounded, not very solid; sometimes slightly produced at the post-basal region; beaks rather low.

MONOCONDYLÆA FRANCISCANA Moricand.

Shell suborbicular, subinflated, subsolid, nearly equilateral; beaks full, somewhat elevated; dorsal outline very lightly arched; dorsal slope almost squarely subtruncate; the remainder of the shell nearly evenly rounded, a little fuller behind the middle of the base; surface nearly smooth with a cloth-like, greenish epidermis, with two or three faint, dark rays on the posterior part; nacre bluish, somewhat iridescent; tooth of the left valve in front of the beak, that of the right opposite the beak; both are compressed and rounded.

Length 38, height 34, diam. 11 mm.

Brazil.

Unio (Monocondylæa) franciscana MORICAND, Mem. Nat. Soc. Hist. Nat. Gen., VIII, 1837, p. 39, pl. III, figs. 14-17.

Margarita (Margaritana) franciscana LEA, Syn., 1838, p. 35.

Margaron (Monocondylæa) franciscana LEA, Syn., 1852, p. 45; 1870, p. 72.

Monocondylæa franciscana Clessin, Conch. Cab. Ano., 1876, p. 251, pl. LXXIV, figs. 4, 5.—Simpson, Syn., 1900, p. 912.

Aplodon franciscana von Ihering, Arch. für Nat., 1893, p. 115.

The shell is not very solid, and is more nearly orbicular than that of any other species.

Monocondylæa lentiformis Lea.

Shell irregularly obovate, short, convex, solid, inequilateral; beaks rather high but not very full, turned forward over a small lunule; dorsal line behind the beaks arched; posterior slope almost squarely truncated; anterior end much narrowed; base rounded, considerably fuller behind the middle; epidermis dirty green; there are one or two faint rays on the posterior ridge; nacre lurid purplish, iridescent behind, thicker in front; prismatic border wide.

Length 40, height 33, diam. 17 mm.

Southern Brazil.

Monocondylæa lentiformis Lea, Pr. Ac. N. Sci. Phila., X, 1866, p. 34; Jl. Ac. N. Sci. Phila., VI, 1868, p. 272, pl. XXXVI, fig. 86; Obs., XII, 1869, p. 32, pl. XXXVI, fig. 86.—Clessin, Conch. Cab. Ano., 1876, p. 250, pl. LXXIX, figs. 4, 5.—Simpson, Syn., 1900, p. 912.

Margaron (Monocondylæa) lentiformis Lea, Syn., 1870, p. 72.

Aplodon lentiformis von Ihering, Arch. für Nat., 1893, p. 67.

The epidermis is badly worn off over most of the surface of the disks in the type, and the cavity of the shell is blotched with greenish-blue. It is a more solid, less inflated species than *franciscana*, is longer and more obovate.

The following species is unknown to me:

Monocondylæa tamsana Dunker, Mal. Bl., V, 1858, p. 226.

Genus IHERINGELLA Pilsbry, 1893.

Plagiodon Lea, Pr. Ac. N. Sci. Phila., VIII, 1856, p. 79.

Iheringella Pilsbry, Nautilus, VII, 1893, p. 30.

Shell solid, inflated, rounded to rhomboid in outline, with a more or less developed posterior ridge; beaks high, curved inward and forward, without sculpture; epidermis dull olive, cloth-like; hinge teeth imperfectly developed, nodulous or broken more or less into denticles, there being an irregular tooth in the left valve under the beak, sometimes partially bifid, and two in the right valve, with the pit between them under the beak; anterior muscle scars deep, more less united; posterior scars shallow; nacre soft, bluish-silvery, iridescent behind.

Animal unknown.

Type, *Plagiodon isocardioides* Lea.

In *Iheringella* the hinge teeth are even more irregular than in *Monocondylæa.* They are more or less tuberculate or often studded with irregular pustules and are sometimes more or less longitudinal.

KEY TO SPECIES OF IHERINGELLA.

Shell much inflated, rhomboid or subrhomboid.	
Surface smooth.	*isocardioides.*
Surface more or less cancellated.	*semisulcata.*
Shell only moderately inflated.	
Outline rounded.	*rotundata.*
Rotund triangular.	*balzani.*

Group of *Iheringella isocardioides.*

Shell rhomboid or *Isocardia*-shaped, with a high, distinct, strongly curved posterior ridge; beaks decidedly full and turned forward.

IHERINGELLA ISOCARDIOIDES (Lea).

Shell smooth, subtriangular or subrhomboid, greatly inflated, inequilateral, subsolid or rather thin; beaks very full and high, turned forward and inward; posterior ridge well developed, subangulate; anterior and posterior ends almost squarely subtruncate; hinge line arched; base nearly straight; epidermis dull olive; teeth imperfect, nodulous, short, the upper division longer, double in each valve; anterior scars deep and confluent;

dorsal scars within the beak cavities, which are deep; nacre white and very iridescent.

Length 27, height 24, diam. 23 mm.

Rio de la Plata; Eastern Peru?

Plagiodon isocardiodes LEA, Pr. Ac. N. Sci. Phila., VIII, 1856, p. 79.

Plagiodon isocardioides LEA, Obs., VI, 1857, p. 38, pl. XXXII, fig. 32; Jl. Ac. N. Sci. Phila., III, 1858, p. 318, pl. XXXII, fig. 32.—KUSTER, Conch. Cab. Unio, 1862, p. 292, pl. XCVII, figs. 8-10.

Unio isocardioides SOWERBY, Conch. Icon., XVI, 1868, pl. XC, fig. 484.

Margaron (Plagiodon) isocardioides LEA, Syn., 1870, p. 71.

Iheringella isocardioides SIMPSON, Syn., 1900, p. 913.

The form of this shell is much like that of *Isocardia moltkiana* as Lea remarks. The teeth are imperfect and somewhat granulate or dentilate.

IHERINGELLA SEMISULCATA (H. Adams).

Shell rhomboid, solid, ventricose, somewhat inequilateral; beaks incurved, but little elevated; posterior ridge well developed, curved, lightly pinched up, ending in a blunt point at the base of the shell; dorsal outline almost evenly arched from the beaks to the end of the posterior ridge; anterior end evenly rounded; base rounded in front, incurved behind the middle; surface rugosely concentrically striate, marked with radial sculpture medially; epidermis subrugose, olivaceous, blackish; nacre pearly white, iridescent.

Length 34, height 25, diam. 18 mm.

Eastern Peru.

Monocondylæa (Plagiodon) semisulcata H. ADAMS, Pr. Zool. Soc. Lond., 1870, p. 376, pl. XXVII, fig. 3.

Iheringella semisulcata SIMPSON, Syn., 1900, p. 913.

Adams does not tell anything of the teeth of this species, but states that he had referred a larger specimen, previously seen, to Lea's *P. isocardioides*, but that on comparing specimens obtained since, he considered the two distinct. This species has a more elongated outline, and is decidedly sculptured, while Lea's shell is smooth.

Group of *Iheringella rotundata.*

Shell somewhat rounded, sublenticular, posterior ridge rather low.

IHERINGELLA ROTUNDATA (Mousson).

Shell short elliptical, inflated, rather solid, inequilateral; beaks full and elevated, somewhat turned forward; posterior ridge narrowly rounded; surface with concentric striæ; epidermis olivaceous-fuscous, teeth short, thick, single in each valve, sulcate; beak cavities deep; nacre whitish, pearly; muscle scars moderate, subtriangular.

Length 52, height 42, diam. 30 mm.

South America.

Plagiodon rotundatus MOUSSON, Mal. Bl., XVI, 1869, p. 187. —PFEIFFER, Nov. Conch., IV, 1876, p. 139, pl. CXXXI, figs. 8, 9.

Iheringella rotundata SIMPSON, Syn., 1900, p. 913.

The outline of the shell of this species is almost regularly short elliptical, there being a very blunt point at the ending of the posterior ridge. I have seen young shells in the collection of Mr. H. E. Sargent, which I refer to this species.

IHERINGELLA BALZANI (von Ihering).

Shell irregularly subtriangular, solid, subinflated, having a much greater diameter behind the beaks, inequilateral; beaks full and high; anterior end narrowed, rounded; hinge line very slightly curved, but much higher behind; posterior end obliquely truncate; base rounded; epidermis thick, interruptedly radiate, blackish or olivaceous-fuscous; nacre white, iridescent; teeth thick, transverse, compressed, double in each valve; prismatic border wide.

Length 86, height 66, diam. 40 mm.

Rio Paraguay; San Paulo, Brazil.

Plagiodon balzani VON IHERING, Arch. für Nat., 1893, p. 69, pl. III, fig. 3.

Iheringella balzani SIMPSON, Syn., 1900, p. 914.

This species is more triangular in outline than *rotundata*, the surface is rougher, the greatest degree of inflation is nearer the posterior end. von Ihering states that the epidermis has very fine, chain-like or twisted striæ.

Genus FOSSULA Lea, 1870.

Fossula LEA, Syn., 1870, p. 72 (footnote).

Shell obovate, inflated, solid, with rather high beaks and a low posterior ridge; epidermis olive-brown, somewhat smooth, sometimes slightly rayed; there is an irregular tooth in the left valve under the beak, and behind it a cavity; in the right valve there is a cavity under the beak, and an irregular tooth in front of and another behind it; the teeth and cavities are generally partly covered with brownish or amber-colored matter, and more or less pitted; anterior cicatrices well marked, united; posterior faint; prismatic border wide.

Animal unknown.

Type, *Monocondylæa fossiculifera* d'Orbigny.

Conchologically the genera *Monocondylæa, Iheringella* and *Fossula* seem to be closely related. In the latter there is a sort of ligamental matter in the cavities between the hinge teeth that is often more or less regularly pitted.

FOSSULA FOSSICULIFERA (d'Orbigny).

Shell obovate, short, subinflated or inflated, rather solid, inequilateral; beaks slightly elevated, not inflated; posterior ridge low, subangulate, sometimes appearing like a raised cord; dorsal outline lightly arched; anterior end narrow, rounded; base well rounded to the end of the posterior ridge at or near the median line; dorsal slope obliquely truncate or subtruncate; surface with rude, irregular growth lines, sometimes with traces of radial striæ; epidermis olive to blackish, dull; left valve with an irregular tooth under the beak or a little in front of it with a cavity in front of and another behind the tooth; right valve with two teeth, one in front of the beak, the other behind it; anterior scars impressed; nacre lurid, bluish to flesh-colored; prismatic border wide.

Length 80, height 63.5, diam. 35 mm.

Length 83, height 57, diam. 37 mm.

Parana River, South America.

Monocondylæa fossiculifera d'ORBIGNY, Guer. Mag., 1835, p. 38; Voy. Am. Mer., 1843, p. 614, pl. LXXX, figs. 5-7.—CLESSIN, Conch. Cab. Ano., 1876, p. 249, pl. XLXIX, figs. 1, 2.

Margarita (Margaritana) fossiculifera LEA, Syn., 1838, p. 28.

Unio fossiculifera HANLEY, Biv. Shells, 1483, p. 213, pl. XXII, fig. 19.—SOWERBY, Conch. Icon., XVI, 1868, pl. XCVI, fig. 521.

Margaron (Monocondylæa) fossiculifera LEA, Syn., 1852, p. 45; 1870, p. 73.

Fossula fossiculifera VON IHERING, Arch. für Nat., 1893, p. 64, pl. III, fig. 2.—SIMPSON, Syn., 1900, p. 914.

Unio fossiculiferus CATLOW and REEVE, Conch. Nom., 1845, p. 59.

Anodonta fusciculifera PÆTEL, Conch. Sam., III, 1890, p. 179.

The cavities or pits in the hinge of this species are often partly filled with a sort of ligamental matter, which is decidedly pitted. The nacre is often considerably thickened in the front part of the shell.

FOSSULA BALZANI von Ihering.

Shell solid, subinflated, irregularly subtriangular or subtrapezoid, concentrically subrugose, somewhat inequilateral; beaks moderately elevated; hinge line sinuous, regularly crenate in the middle; anterior end narrowed, subtruncate; base curved; posterior end obliquely subtruncate, rounded where it joins the base; epidermis fuscous-olivaceous; nacre lead-colored, with bronzy maculations.

Length 86, height 66, diam. 40 mm.

Rio Paraguay; Rio Apae, South America.

Fossula balzani VON IHERING, Arch. für Nat., 1893, p. 65, pl. III, fig. 1.—SIMPSON, Syn., 1900, p. 914.

The form of this does not differ greatly from some of Lea's specimens of *fossiculifera,* but the regular crenation in the middle of the hinge line, if constant, ought to be a good distinguishing character.

FOSSULA BRAZILIENSIS von Ihering.

"This species is considerably smaller than *F. fossiculifera* and is distinguished from it by the smaller anterior end and the much more inflated posterior half of the shell. The beaks are smaller and less prominent than in that species. In the example from the Paraguassu River, which is 42 mm. long, 33 mm. high and 22 mm. in diameter, they are situated at 13 mm. from the anterior end. The length of the hinge to the beginning of the sinulus is 26 mm. and the distance of the beaks from its anterior end is 8 mm. The dorsal margin is obliquely inclined from behind and above to the front and is slightly convex posteriorly. Posterior margin oblique above and convex below, forming a blunt angle at about the centre. The anterior margin is regularly rounded. Ventral margin oblique and nearly straight in front, convex behind. The greatest height is at 13 mm. from the posterior end. Surface smooth, with close, thread-like growth lines, which towards the ventral margin become irregular, thicker and further apart. Somewhat in front of the centre is a broad, flat impression, which extends from the beaks to the ventral margin. Behind this impression the shell is remarkably inflated. From the beaks to the angle in the posterior margin is a strong elevated line, which borders the somewhat concave dorsal area. The lunule is very small, quite indistinct. At the anterior end of the hinge are three downward pointed continuations of the ligament, through which the tooth-like thickenings of the hinge, which are lacking in the right valve, are shown. The rather thick hinge of the right valve has a long, subobsolete, forwardly curved tooth, which fits into a ligament covered cavity in the left valve, 7 mm. long. On the closed shell, which gapes only a little in front and behind, the beaks are 2 mm. from each other and the part of the shell visible between them belongs to the right valve. The sinulus is triangular, hook-shaped below and sharply pointed in front and lies at the posterior end of the dorsal margin. The umbonal cavity is comparatively deep. The muscular impressions are deep. The prismatic border of the shell is 3 mm. wide at the anterior portion of the ventral margin. The very iridescent nacre is pale reddish with large greenish spots." (von Ihering).

Type locality, Rio Paraguassu, State of Bahia, Brazil.

Fossula braziliensis von Ihering, Abh. Senck. Ges., XXXII, 1910, p. 116, pl. 12, figs. 1*a-b*.

"This species is easily distinguished from *F. fossiculifera* by its smaller size, less prominent teeth and the more posterior position of the sinulus. One specimen from Machedo Portella has two carinæ defining the dorsal area. Two other specimens from the same locality are 52 mm. long and have a well-developed lunule, short and broad. The epidermis of these is a dark brown or olive-brown color.

Genus LEILA Gray, 1840.

Columba Lea (not *Columba* Linnæus, Aves, 1758), Tr. Am. Phil. Soc., V, 1833, p. 78.

Leila Gray, Syn. Brit. Mus., 1840, p. 142.

Shell large, obovate, inflated, with a straight hinge line, which is produced into a slight wing before and behind; the posterior end bluntly pointed and somewhat truncate above, with a faint posterior ridge; beaks full, smooth; epidermis olive, generally smooth; hinge edentulous; beak cavities rather shallow; dorsal scars small and numerous, running in a straight line from behind the beaks downward and forward; posterior muscle scars united, large; pallial line generally showing a sinus.

Animal having the mantle united behind into two short, separate, contractile siphons, according to Gray.

Type, *Anodonta blainvilleana* Lea.

Conchologically this genus seems to be very closely related to *Anodontites*, especially to the group of *A. trapesialis*. Some of the shells of that genus have a slight dorsal wing in front and behind, and traces of a pallial sinus.

LEILA BLAINVILLEANA (Lea).

Shell obovate, subinflated, bihiant, inequilateral, subsolid; beaks rather full, long and high; posterior ridge narrowly rounded; above the ridge there is a wide, radial depression; dorsal line nearly straight, produced into a pointed wing in front and a slopingly truncate one behind; anterior end very narrow, much cut away below; base rounded, much fuller behind the middle; posterior end bluntly pointed at or below the median line; surface with irregular growth lines; epidermis dark olive, with indications of delicate, radial striæ; hinge line edentulous; ligamental patches triangular; muscle scars shallow; nacre flesh-colored; pallial line with a broad, shallow sinus behind.

Length 153, height 93, diam. 54 mm.

Peru; Brazil; south to Argentina.

Anodonta blainvilleana LEA, Tr. Am. Phil. Soc., V, 1834, p. 77, pl. XII, fig. 35; Obs., I, 1834, p. 189, pl. XII, fig. 35.—HANLEY, Biv. Shells, 1843, p. 222, pl. XXIV, fig. 18.

Margarita (Anodonta) blainvilleana LEA, Syn., 1836, p. 53; 1838, p. 31.

Anodon blainvilleana CATLOW and REEVE, Conch. Nom., 1845, p. 66.

Margaron (Anodonta) blainvilleana LEA, Syn., 1852, p. 52.

Leila blainvilleana H. and A. ADAMS, Gen. Rec. Moll., II, 1857, p. 507; III, pl. CXIX, figs. 4, 4*a*.—CHENU, Man., 1859, II, p. 148, fig. 730.—SIMPSON, Syn., 1900, p. 915.

Columba blainvilleana CLESSIN, Conch. Cab. Ano., 1876, p. 253, pl. LXXXVI, figs. 1, 2.

Anodon parishii GRAY, Pr. Zool. Soc. Lond., 1834, p. 57.

Margarita (Anodonta) parishii LEA, Syn., 1836, p. 53; 1838, p. 31.

Anodonta parishii HANLEY, Test. Moll., 1842, p. 222.

Margaron (Anodonta) parishii LEA, Syn., 1852, p. 52.

Leila parishii H. and A. ADAMS, Gen. Rec. Moll., II, 1857, p. 507.

Anodon hians SOWERBY, Conch. Icon., XVII, 1867, pl. IV, fig. 8.

The type is a young left valve, which has been almost entirely denuded of its epidermis. All the shells I have seen gape widely at the anterior base and at the end of the posterior ridge. The hinder end is pointed.

LEILA ESULA (d'Orbigny).

Shell irregularly obovate, somewhat inflated, rather thin, inequilateral; beaks full and high; dorsal line nearly straight or a little sinuous, ending in a sharp pointed wing in front, scarcely winged behind; dorsal slope obliquely subtruncate, there being but a low angle where its outline joins the hinge; anterior end much narrowed, cut away below; base almost evenly rounded, a little fuller behind the middle; posterior end widely rounded; surface yellow-green; nacre white, iridescent; pallial line widely sinused behind; anterior scars complex.

Bolivia; Brazil; Paraguay.

Iridina esula d'ORBIGNY, Guerin Mag., 1835, p. 43; Voy. Am. Mer., 1843, p. 597.

Anodonta esula JAN, Charpentier and Jan, Cat., 1837, p. 24.

Margarita (Anodonta) esula LEA, Syn., 1838, p. 32.

Margaron (Anodonta) esula LEA, Syn., 1852, p. 52.

Margaron (Columba) esula LEA, Syn., 1870, p. 86.

Leila esula SIMPSON, Syn., 1900, p. 915.

Anodonta arcuata HANLEY, Biv. Shells, 1843, p. 223.

Leila pulvinata HUPÉ, Moll. Nouv., III, 1857, p. 90, pl. XX, fig. 1.

Columba pulvinata CLESSIN, Conch. Cab. Ano., 1876, p. 255, pl. LXXV, figs. 1, 2.

Anodon pulvinatus SOWERBY, Conch. Icon., XVII, 1867, pl. V, fig. 10.

Leila castelnaudi HUPÉ, Moll. Nouv., III, 1857, p. 91, pl. XIX, fig. 1.

Anodon castelnaudi SOWERBY, Conch. Icon., XVII, 1868, pl. XX, fig. 79.

Columba castelnaudii CLESSIN, Conch. Cab. Ano., 1876, p. 254, pl. LXXXIV, figs. 1, 2.

The synonymy of the form described above seems to be somewhat involved. d'Orbigny used the name *Iridina esula* in 1835 for a species, which he credits to Jan, and states that it equals Lea's *Anodonta blainvilleana.* In the Voyage Amerique Meridionale he describes this species, stating that the anal end is rounded, a character quite different from that of Lea's species, but exactly like that of the *Leila pulvinata* of Hupe. I have not had access to Charpentier and Jan's catalogue, nor am I aware that the latter described *Anodonta esula* prior to 1835. It would probably be better to use Hupe's name, as he gave good figures and a description of his species.

LEILA SPIXII (von Ihering).

Shell irregularly obovate, thin, inflated, concentrically striate, somewhat inequilateral; beaks full; hinge line straight; anterior end narrowed, angled above, rounded below; base slightly cut away in front, rounded for the most part, quite full at the middle; posterior end subtruncate above, rounded below; epidermis pale olive-green, with dark brown bands and faint, dark green rays; muscle scars large; nacre bluish-white, iridescent; pallial line irregular, distant from the border, having an irregular posterior sinus.

Length 84, height 59 mm.

Amazon River.

Anodon giganteus SPIX (part), Test. Bras., 1827, p. 27, pl. XIX, fig. 1 (young).

Anodonta gigantea KUSTER, Conch. Cab. Ano., 1853, p. 6, pl. I, fig. 2 (young).

Columba spixii VON IHERING, Arch. für Nat., 1890, p. 135, pl. IX, fig. 4.

Leila spixii SIMPSON, Syn., 1900, p. 916.

Von Ihering has shown in the Archiv für Naturgeschichte, 1890, p. 135, that the smaller of the two shells figured by Spix as *Anodon giganteus* is a distinct species which he refers to *Columba* and to which he gives the specific name *spixii.* It is a smaller species than the *Leila esula,* it is not so pointed in front as is that species or *L. blainvilleana,* and it is faintly marked with rather wide rays.

Genus ANODONTITES Bruguire, 1792.

Anodontites BRUGUIERE, Journ. Hist. Nat. Paris, I, 1792, p. 131.

Patularia SWAINSON, Malacology, 1840, pp. 287, 381.

Glabaris GRAY, Proc. Zool. Soc. Lond., 1847, p. 197.—SIMPSON, Syn., 1900, p. 916.

Shell rounded to elongated, inflated, subsolid; beaks full, smooth; epidermis smooth or cloth-like, rarely having faint rays; hinge line straight or slightly curved, edentulous, sometimes a little sinuous, the escutcheon distinct and large; nacre soft tinted, the prismatic border wide and well defined.

Animal with the marsupium occupying the whole of the inner branchiæ, which are united their entire length to the abdominal sac; palpi generally semicircular or kidney-shaped; attached along their entire upper length, not projecting posteriorly; branchial and anal openings with or without papillæ, not united into siphons in the specimens examined, separated by a strong bridge; superanal opening not closed below.

Type, *Anodontites crispatus* Brug.

Section ANODONTITES s. s.

Shell rounded to elliptical; posterior ridge low or wanting.

Group of *Anodontites patagonicus*.

Shell solid, inflated, obovate, usually somewhat produced behind the center of the base; beaks quite full, projecting above the hinge line; epidermis olive-brown, rather smooth, generally rayless; anterior muscle scars well defined.

Animal with the gills large, rounded below; palpi rather large; mantle thickened at edge, and furnished with palpi in front of the branchial opening; branchial opening large, with numerous minute papillæ; anal opening large, with no papillæ.

ANODONTITES PATAGONICUS (Lamarck).

Shell quite variable in form, usually somewhat obovate, convex to subinflated, solid, inequilateral; beaks moderately full and high; dorsal line lightly arched; anterior end more or less narrowed, rounded; base line curved or rounded, often fuller behind the middle; dorsal slope obliquely truncate or subtruncate; posterior ridge low, with usually a shallow radial groove just above it; surface with more or less strongly developed growth lines; epidermis brownish to olive; hinge edentulous; ligamental patch triangular, deep; anterior scars well marked, posterior scars faint; nacre whitish or flesh-colored dull; prismatic border wide on the base.

Length 87, height 57, diam. 37 mm.

Length 81, height 59, diam. 32 mm.

Southern South America, east of the Andes.

Anodonta patagonica LAMARCK, An. sans. Vert., VI, 1819, p. 88; Enc. Meth., II, 1827, p. 147, pl. 203, fig. 1.—KUSTER, Conch. Cab. Ano., 1853, p. 50, pl. XII, fig. 2.

Margarita (Anodonta) patagonica LEA, Syn., 1836, p. 52; 1838, p. 31.

Anodon patagonica CATLOW and REEVE, Conch. Nom., 1845, p. 67.

Margaron (Anodonta) patagonica LEA, Syn., 1852, p. 51; 1870, p. 82.

Glabaris patagonicus SIMPSON, Syn., 1900, p. 916.

Anodon trapezeus SPIX, Test. Fluv. Bras., 1827, p. 28, pl. XX, fig. 1.

Anodonta trapezeum d'ORBIGNY, Voy. Am. Mer., 1843, pp. 6, 19.

Anodonta trapezea KUSTER, Conch. Cab. Ano., 1853, p. 7, pl. I, fig. 3.

Glabaris trapezea VON IHERING, Arch. für Naturg., 1893, p. 57.

Anodonta lato-marginata LEA, Tr. Am. Phil. Soc., V, 1834, p. 76, pl. XII, fig. 34; Obs., I, 1834, p. 188, pl. XII, fig. 34.—HANLEY, Biv. Shells, 1843, p. 221, pl. XXIV, fig. 14.—CHENU, Man., II, 1859, p. 146, fig. 724.—CLESSIN, Conch. Cab. Ano., 1873, p. 76, pl. XXI, figs. 3, 4.

Margarita (Anodonta) lato-marginata LEA, Syn., 1836, p. 53; 1838, p. 31.

Margaron (Anodonta) lato-marginata LEA, Syn., 1852, p. 51; 1870, p. 82.

Anodon lato-marginatus Sowerby, Conch. Icon., XVII, 1867, pl. II, fig. 3.

Anodon lati-marginata Catlow and Reeve, Conch. Nom., 1845, p. 67.

Anodonta lati-marginata Strobel, Mat. Mal., Pt. I, 1874, p. 67.

Anodonta membranacea d'Orbigny, Voy. Am. Mer., 1843, p. 616, pl. LXXIX, fig. 11.

Anodonta solida Kuster, Conch. Cab. Ano., 1853, p. 50, pl. XII, fig. I.

Anodonta uruguayensis Lea, Pr. Ac. N. Sci., Phila., IV, 1860, p. 92; Jl. Ac. N. Sci. Phila., V, 1863, p. 393, pl. XLVIII, fig. 302; Obs., X, 1863, p. 29, pl. XLVIII, fig. 302.—Clessin, Conch. Cab. Ano., 1874, p. 114, pl. XXXVIII, figs. 1, 2.—Sowerby, Conch. Icon., XVII, 1870, pl. XXX, fig. 121.

Margaron (Anodonta) uruguayensis Lea, Syn., 1870, p. 83.

Columba uruguayensis Pætel, Conch. Sam., III, 1890, p. 188.

Anodonta sinuosa Clessin, Conch. Cab. Ano., 1873, p. 90, pl. XXII, figs. 1, 2.

Anodonta serpentina Clessin, Conch. Cab. Ano., 1876, p. 223, pl. LXXV, figs. 2, 3.

I have no doubt but that Lamarck's *Anodonta patagonica* is the same as Lea's *A. lato-marginata*. The description of the former is very brief, but the figures in the Encyclopedie Methodique, which are referred to, represent the species very accurately. The shell is represented in the external view as having concentric bands and certain specimens in the large series that I have seen are thus banded.

Lea's type of *Anodonta uruguayensis*, an old worn shell, is the only one in the collection, save a few very young that are doubtfully the same. It is a little more inflated than most specimens that are called *lato-marginata*, and may possibly be distinct.

Var. *felix* (Pilsbry).

Similar in form to the type, but the epidermis is light yellowish-green, painted with short, radiating, dichotomous or simple lines, or narrow V's of green with two green rays on the posterior slope. Interior pale pink within the pallial line; prismatic border faint olive-buff. There are some black zigzags along the pallial line or outlining the muscle scars.

Colonia, Uruguay.

Glabaris lato-marginatus LEA, var. *felix* PILSBRY, Pr. Ac. N Sci. Phila., 1896, p. 563, pl. XXVI, fig. 8.

Glabaris patagonicus var. *felix* SIMPSON, Syn., 1900, p. 917.

ANODONTITES CRASSUS (Swainson).

Shell irregularly obovate or somewhat pentagonal, scarcely subinflated, solid, inequilateral; beaks full and high; hinge line lightly curved; dorsal slope strongly, obliquely truncate; anterior end narrowed, rounded or subtruncate, angled above; base line nearly straight in front, very full and subangulate behind the middle; surface with well-marked growth lines; epidermis dark grass-green; nacre whitish with iridescent tints; muscle scars deep.

Length 80, height 52, diam. 32 mm.

Rio de la Plata.

Anodon crassus SWAINSON, Zool. Ill., 1st ser., III, 1823, pl. CLXVII.

Margarita (Anodonta) crassa LEA, Syn., 1836, p. 23; 1838, p. 32.

Anodonta crassa HANLEY, Test. Moll., 1842, p. 222.

Anodon crassa CATLOW and REEVE, Conch. Nom., 1845, p. 66.

Margaron (Anodonta) crassa LEA, Syn., 1852, p. 52; 1870, p. 83.

Glabaris crassus SIMPSON, Syn., 1900, p. 917.

Close to *A. patagonicus*, but I have never seen a specimen of that species quite so elongated or so pentagonal as the figure represents Swainson's shell to be. His shell is said to be deep grass-green, while *patagonicus* is always more or less brown, it has its greatest diameter well forward while that of *patagonicus* is at the middle. Swainson gives no measurements and I have given those of his figures.

It is claimed in the Testacea Fluviatilia that this is the same as the *Anodon giganteus* of Spix, but this is certainly an error.

ANODONTITES WYMANII (Lea).

Shell long obovate, rather solid, convex or subinflated, inequilateral; beaks but little elevated or inflated; dorsal outline arched; anterior end narrowed and rounded; base rounded, a little fuller behind the middle; dorsal slope obliquely subtruncate; posterior end somewhat biangulate about at the median line; surface irregularly, concentrically striate; epidermis cinnamon red to brownish; ligamental patch narrow, elongated: muscle scars well marked; nacre rose-tinted, with a brownish-red prismatic border.

Length 80, height 50, diam. 30 mm.

Uruguay River, South America.

Anodonta wymanii LEA, Pr. Ac. N. Sci. Phila., IV, 1860, p. 91; Jl. Ac. N. Sci. Phila., V, 1863, p. 390, pl. XLIV, fig. 294; Obs., X, 1863, p. 26, pl. XLIV, fig. 294.—CLESSIN, Conch. Cab. Ano., 1873, p. 104, pl. XXXII, figs. 1, 2.

Margaron (Anodonta) wymanii LEA, Syn., 1870, p. 80.

Anodon wymani SOWERBY, Conch. Icon., XVII, 1870, pl. XXX, fig. 117.

Glabaris wymanii SIMPSON, Syn., 1900, p. 917.

More elongated and more richly colored than *A. patagonicus*. It is quite richly colored within as well as without.

ANODONTITES SIRIONIS (d'Orbigny).

Shell oblong almost evenly elliptical, subsolid to rather thin, convex or subinflated, inequilateral; beaks moderately full and elevated; dorsal slope obliquely subtruncate; surface rather strongly and irregularly, concentrically striate, sometimes showing faint radiating lines of wrinkles; epidermis greenish to brownish, scarcely shining; ligamental scars triangular; muscle scars shallow; nacre bluish-green, sometimes with purplish tintings.

Length 87, height 50, diam. 37 mm.

Rio de la Plata.

Anodonta sirionis d'ORBIGNY, Mag. Zool., 1835, p. 40; Voy. Am. Mer., 1843, p. 615, pl. LXXIV, figs. 4-6; LXXX, figs. 1.4. —CLESSIN, Conch. Cab. Ano., 1874, p. 128, pl. XLI, figs. 1, 2.

Margarita (Anodonta) sirionis LEA, Syn., 1838, p. 31.

Anodon sirionis Catlow and Reeve, Conch. Nom., 1845, p. 68.
Margaron (Anodonta) sirionis Lea, Syn., 1852, p. 51; 1870, p. 82.
Glabaris sirionis Simpson, Syn., 1900, p. 918.
Anodonta ferrarisii d'Orbigny, Guer. Mag., 1835, p. 40.

Very close to *A. wymanii*, but probably different. I have specimens before me that I refer with some doubt to this species, which are somewhat rhomboid. It is hardly as solid a species as *wymanii*; it is not so much produced in the post-basal region; the texture is different, for instead of being bright and warm within and without it is cold and lurid.

Var. *iheringi* (Clessin).

Shell slightly obovate oblong, subinflated, solid, inequilateral, with well marked, concentric sculpture; beaks full and high; dorsal outline arched; anterior end somewhat narrowed and rounded; posterior end subtruncate above, widely rounded below; base line lightly rounded; epidermis chestnut; ligament long, thick; nacre whitish.

Length 61, height 39, diam. 22 mm.

Taguara del Mundo novo, Brazil.

Anodonta iheringi Clessin, Mal. Bl., V, 1882, p. 191, pl. IV, fig. 5.
Glabaris iheringi Simpson, Syn., 1900, p. 919.

After comparing a set of what I take to be Clessin's *A. iheringi* with specimens of *sirionis* Orb. and the descriptions and figures of the two species I am inclined to believe that the former is not more than a variety of the latter. Clessin states that his shell has chestnut epidermis and white nacre, but there are specimens before me, in which the epidermis is olive-colored and the nacre bluish-white.

Anodontites pazii (Lea).

Shell round-obovate, subinflated, subsolid, inequilateral; beaks moderately full, slightly elevated; dorsal line lightly arched; anterior end somewhat narrowed, rounded; base rounded; dorsal slope obliquely subtruncate; surface with irregular growth lines; epidermis brownish-olive or brown-tinted violet; ligamental patch small, triangular; muscle scars indistinct; nacre violet-tinted, rich and iridescent; prismatic border wide, reddish-tinted.

Length 60, height 43, diam. 26 mm.

Length 53, height 38, diam. 26 mm.

South America.

Anodonta pazii LEA, Pr. Ac. N. Sci. Phila., X, 1866, p. 35; Jl. Ac. N. Sci. Phila., VI, 1868, p. 274, pl. XXXVI, fig. 87; Obs., XII, 1869, p. 39, pl. XXXVI, fig. 87.—CLESSIN, Conch. Cab. Ano., 1874, p. 139, pl. XLIII, figs. 3, 4.

Margaron (Anodonta) pazii LEA, Syn., 1870, p. 81.

Glabaris pazii SIMPSON, Syn., 1900, p. 918.

I have before me the type, the epidermis of which has been somewhat worn away, and another smaller and more inflated shell, which I refer to this with a little doubt. Lea remarks that the nacre is the most intensely red of any *Anodonta* with which he is acquainted. Indeed the whole shell is tinged with this reddish or violet-red color, which is one of its best distinguishing characters.

ANODONTITES RUBICUNDUS (Lea).

Shell suborbicular, subinflated, scarcely subsolid, slightly inequilateral; beaks considerably elevated, though not very full; dorsal line very lightly arched; dorsal slope widely and almost squarely truncate; anterior end a little narrowed and with the base rounded; surface with irregular growth lines; epidermis dark olive, with two feeble, darker rays on the posterior ridge; muscle scars shallow; ligamental patch small, triangular; nacre bluish, tinted reddish and violet at the border.

Length 59, height 51, diam. 30 mm.

Length 77, height 61, diam. 36 mm.

Uruguay River, South America.

Anodonta rubicunda LEA, Pr. Ac. N. Sci. Phila., IV, 1860, p. 92; Jl. Ac. N. Sci. Phila., V, 1863, p. 392, pl. XLVI, fig. 299; Obs., X, 1863, p. 28, pl. XLVI, fig. 299.—CLESSIN, Conch. Cab. Ano., 1876, p. 106, pl. XXXII, figs. 5, 6.

Anodon rubicundus Sowerby, Conch. Icon., XVII, 1870, pl. xxx, fig. 118.

Margaron (Anodonta) rubicunda Lea, Syn., 1870, p. 75.

Glabaris rubicundus Simpson, Syn., 1900, p. 918.

The type of this species has the epidermis considerably eroded. It is a shorter shell than *pazii,* not so solid nor richly colored, the posterior end is widely and almost squarely truncate, meeting the dorsal line nearly at a right angle, while in *pazii* it is slopingly subtruncate or slightly rounded. In the type the nacre at the border shows colored bands.

Anodontites rotundus (Spix).

Shell almost orbicular, a little narrower in front, subsolid, inequilateral, subinflated; beaks elevated and full, turned in over a long, narrow, clean lunule; posterior end sometimes slightly truncate, often almost evenly rounded; hinge line curved; surface almost smooth; epidermis finely and delicately, concentrically wrinkled, olive, greenish-brown or yellowish-brown, often feebly rayed and having two or three broad, darker rays on the dorsal slope; nacre bluish, silvery, having a narrow, outer, iridescent border, and delicately, radially striate throughout; prismatic border wide, lurid.

Length 75, height 64, diam. 38 mm.

Brazil.

Anodon rotundus Spix, Test. Fluv. Bras., 1827, p. 28, pl. xx, figs. 2-4.

Anodon rotunda Kuster, Conch. Cab. Ano., 1853, p. 33, pl. viii, fig. 1.

Margaron (Anodonta) rotunda Lea, Syn., 1870, p. 81.

Glabaris rotunda von Ihering, Arch. für Nat., 1893, p. 59.

Glabaris rotundus Simpson, Syn., 1900, p. 918.

Anodonta cailliaudii Lea, Pr. Ac. N. Sci. Phila., IV, 1860, p. 308; Jl. Ac. N. Sci. Phila., V, 1863, p. 395, pl. xlv, fig. 297; Obs., X, 1863, p. 31, pl. xlv, fig. 297.—Clessin, Conch. Cab. Ano., 1873, p. 105, pl. xxxii, figs. 3, 4.

Anodon cailliaudi Sowerby, Conch. Icon., XVII, 1867, pl. xii, fig. 38.

Margaron (Anodonta) cailliaudii Lea, Syn., 1870, p. 81.

This is probably the finest species of the genus. The figure and description by Spix are of a young shell, not more than 35 millimeters in length, but they perfectly fit young shells of Lea's *Anodonta cailliaudii.* It is one of the most nearly orbicular of the Naiades, being but slightly narrower in front, and often not at all truncate behind. It differs from *rubicundus* in its rounded posterior end and the color of its nacre; from *pazii* in its external and internal color. The radial sculpture of the nacre is a good distinguishing character.

ANODONTITES SPIXII (d'Orbigny).

Shell elliptic rhomboid, inflated, rather solid, inequilateral; beaks full and high; dorsal line arched; anterior end rounded; base rounded; posterior slope obliquely subtruncated; posterior ridge rounded, ending in a blunt point a little above the base of the shell; surface with irregular, concentric sculpture, some of it rather coarse, part of it fine and wavy; epidermis brownish; muscle scars shallow; nacre flesh-colored, with greenish, iridescent tints behind; pallial line with a small sinus behind; prismatic border well marked.

Length 93, height 68, diam. 47 mm.

Rio Parana.

Unio (Anodontes) spixii d'ORBIGNY, Guerin Mag., 1835, p. 39.
Glabaris spixii SIMPSON, Syn., 1900, p. 932.

In 1835, in the Guerin Magazine, d'Orbigny used the name *Unio (Anodontes) spixii* d'Orbigny, and stated that it equaled *Anodon rotundus* of Spix and *A. trapezeus* Spix, but he gave no description. In the Voyage Amerique Meridionale he repeated the same statement, but gave a brief Latin description. This description does not agree with either *A. rotundus* Spix or *A. trapezoideus* Spix, which I believe are distinct species, but it does agree fairly with a specimen sent by d'Orbigny to Dr. Lea, labeled by the former "*Ano. spixi* Orb." While this is close to some other forms of the group, I am inclined to believe that it is a valid species and have used the name apparently applied by d'Orbigny to it.

ANODONTITES MEMBRANACEUS (Maton).

Shell small, subinflated, thin and fragile, irregularly obovate, almost equilateral; hinge line straight or curved downward a little medially; anterior end narrowed, rounded; base well rounded, fuller behind the middle; posterior end wide, rounded, joining the dorsal edge at an angle where it is produced into a small wing; beaks full, rounded; epidermis greenish, lighter colored at the umbonal region; nacre smooth, submargaritaceous, transversely, delicately striated.

Length 24, height 17 mm.

Rio de la Plata.

Mytilus membranaceus MATON, Tr. Linn. Soc. Lond., 1811, p. 329, pl. XXIV, figs. 11, 12.

Margarita (Anodonta) membranacea LEA, Syn., 1836, p. 22; 1838, p. 23.

Margaron (Anodonta) membranacea LEA, Syn., 1852, p. 34; 1870, p. 55.

Unio membranaceus HANLEY, Test. Moll., 1842, p. 202.

Glabaris membranaceus SIMPSON, Syn., 1900, p. 919.

Unio subtrapezius PHILIPPI, Zeits. für Mal., IV, 1847, p. 96; Abbild., III, 1848, p. 80, pl. V, fig. 3.—KUSTER, Conch. Cab. Unio, 1862, p. 283, pl. XCV, fig. 4.

Maton states that his shell is fragile and membranaceous, that the nacre is transversely striate. I am not certain whether he means by the last statement that it is concentrically striate, showing the growth lines or that it is radially striate as is the case with many species of *Anodontites*. It is possible that his shell is but the young of some other well-known form, but I know of no species of this group in which the young is fragile and membranaceous.

ANODONTITES LEOTAUDI (Guppy).

Shell somewhat rhomboid obovate, convex, scarcely subsolid, inequilateral; beaks moderately full and elevated; dorsal and basal outlines curved; anterior end a little narrowed, rounded; dorsal slope obliquely subtruncate, below which the posterior end is rounded; surface irregularly, concentrically sculptured; epidermis chestnut with faint vestiges of darker rays on the dorsal slope, subshining; nacre flesh-colored or purple-tinted, iridescent; muscle scars shallow; ligamental patch triangular.

Length 63, height 37, diam. 20 mm.

Trinidad Island, West Indies.

Anodonta leotaudi GUPPY, Ann. and Mag., XIV, 1864, p. 243.
Margaron (Anodonta) leotaudi LEA, Syn., 1870, p. 83.
Glabaris leotandi SIMPSON, Syn., 1900, p. 929.

At the time of publishing the Synopsis I had never seen this species, and as it had not been figured I was unable to give any idea as to its relationships. Recently Mr. William Moss, of Ashton-under-Syne, England, has donated an authentic specimen from Trinidad to the National Museum. This shell is somewhat worn, having been taken dead, but it is in condition to give a fair idea of the characters of the species. I place it with some hesitation in the group of *A. patagonicus*. It scarcely gapes either in front or behind.

Group of *Anodontites brevis*.

Shell rhomboid, swollen, with full, high beaks and a pinched-up posterior ridge.

ANODONTITES BREVIS (Sowerby).

Shell rhomboid, inflated, solid, rather short, somewhat inequilateral; beaks full and elevated; posterior ridge angled, pinched up; hinge line nearly straight; posterior end slopingly rounded; anterior end rounded, cut away slightly below; base curved; epidermis blackish-brown, sinuously striated; nacre orange with a thick border.

Length 66, height 43.5 mm.

La Plata, S. America.

Anodon brevis SOWERBY, Conch. Icon., XVII, 1870, pl. XXXI, fig. 124.
Glabaris brevis SIMPSON, Syn., 1900, p. 932.

I have never seen this species and know nothing whatever about it excepting from Sowerby's figure and very brief description. Certain specimens of *Strophitus edentulus* answer very well to this figure and description, excepting the somewhat pinched-up posterior ridge, which may not be correctly drawn. I know of no South American Naiad at all like it and I would not be surprised if it was a rather unusual specimen of the species to which I have compared it.

Group of *Anodontites crispatus*.

Shell elliptical obovate, slightly produced at the posterior base, and straight or very feebly incurved in front of it; epidermis fuscous or tawny, cloth-like behind, somewhat rayed by more or less incised lines in front, where it is wrinkled like dried paint, the wrinkles often being looped; nacre lurid, bluish, somewhat iridescent.

Animal having gills of thin, semi-transparent texture, with wide, vertical, light-colored ridges, the whole beautifully reticulated under a glass, inner wider, united throughout to the abdominal sac; palpi rather small, semicircular, attached along their entire upper border; mantle thin, very thick on the border; branchial opening with short, fleshy palpi; anal and superanal openings united, but separated from the branchial opening by a strong bridge.

ANODONTITES CRISPATUS Bruguiere.

Shell long rhomboid or long obovate, thin or scarcely subsolid, convex, inequilateral; beaks not full or greatly elevated; posterior ridge full, rounded or faintly biangulate; anterior end narrowed and rounded; dorsal outline nearly straight; posterior end sometimes obliquely subtruncate above, sometimes almost evenly rounded, occasionally biangulate below; base nearly straight; in front of the posterior ridge there is sometimes a broad, shallow, radial depression; surface with radial sulcations and concentric growth lines, which are broken into loops at the radial grooves; epidermis greenish-yellow or tawny; nacre blue; muscle scars shallow.

Length 53, height 27.5, diam. 17 mm.

Widely distributed in tropical South America.

Anodontites crispata BRUGUIERE, Jl. d'Hist. Nat., I, 1792, p. 131.
Anodonta crispata LAMARCK, An. sans Vert., VI, 1819, p. 86.
Margarita (Anodonta) crispata LEA, Syn., 1836, p. 48; 1838, p. 29.
Anodon crispata CATLOW and REEVE, Conch. Nom., 1845, p. 66.
Margaron (Anodonta) crispata LEA, Syn., 1852, p. 47; 1870, p. 75.
Glabaris crispatus SIMPSON, Syn., 1900, p. 919.
? Anodonta crispa LAMARCK, Enc. Meth., II, 1827, p. 147, pl. CCIII, fig. 3.
Anodonta puberula GOULD, U. S. Expl. Ex., XII, 1852, p. 434, figs. 548, 548*a*, 548*b*.
Anodon reticulatus SOWERBY, Conch. Icon., XVII, 1867, pl. X, fig. 27.
Margaron (Anodonta) reticulata LEA, Syn., 1870, p. 80.
Anodonta reticulata PÆTEL, Conch. Sam., III, 1890, p. 184.

Specimens, which are before me labeled *Anodonta crispata* Lam., agree fairly well with Lamarck's description and the figures in the Encyclopedie Methodique, and with Gould's type of *A. puberula*. It is a small species and varies much in the degree of its sculpture.

ANODONTITES CHEEZIANUS (Sowerby).

Shell almost evenly long elliptical, inflated, solid, dull olive, with irregular growth lines and delicate radial lines on the front half; beaks only moderately elevated, flesh-colored; dorsal outline lightly arched; dorsal slope obliquely truncate; anterior end narrowed, rounded; base very slightly incurved medially; posterior ridge full, rounded, ending in a rounded point at the base of the shell; surface striate and subrugose; epidermis yellowish-green; nacre bluish-white.

Length 48, height 27 mm.

Anodon cheeziana SOWERBY, Conch. Icon., XVII, 1867, pl. XV, fig. 52.
Glabaris cheeziana SIMPSON, Syn., 1900, p. 932.

Only a brief description is given for this species and no locality is assigned. In most characters it agrees with *A. cris-*

patus, but, according to the description, it is a solider, more inflated form, and is perhaps a little darker colored. I feel sure that it is an *Anodontites* belonging to the *crispatus* group.

ANODONTITES PHILIPPIANUS (Simpson).

Shell decidedly trapezoid, scarcely subsolid, rather compressed; inequilateral; beaks moderately full and elevated; dorsal outline lightly arched; dorsal slope obliquely truncate; anterior end narrowed, rounded; base very slightly incurved medially; posterior ridge full, rounded, ending in a rounded point at the base of the shell; surface striate and subrugose; epidermis yellowish-green; nacre bluish-white.

Length 53, height 32, diam. 18 mm.

Ucayali River, Peru.

Anodonta subsinuata PHILIPPI, Mal. Bl., XVI, 1869, p. 41.—PFEIFFER, Nov. Conch., III, 1869, p. 487, pl. cv, figs. 7, 8.

Glabaris philippianus SIMPSON, Syn., 1900, p. 919.

According to the outline figure giving a dorsal view of this shell it is compressed along the middle. The statement that the surface is rough and wrinkled would seem to show that it belonged in this group. The species is more rhomboid in outline than *A. crispatus* and is apparently more greenish in color.

The name *subsinuata*, applied to this by Philippi, will have to be placed in the synonymy, as Sowerby used it previously for an *Anodontites* which he placed in *Anodonta*.

ANODONTITES NAPOENSIS (Lea).

Shell irregularly elliptical, oblong, solid, convex, inequilateral; dorsal outline strongly and almost evenly curved from the narrowed anterior end to the end of the posterior ridge; base line but slightly curved; surface having irregular growth lines; epidermis marked with radial rows of fine, zigzag wrinkles, almost black at the border, lighter colored at the umbonal region; muscle scars deep, the anterior ones large; nacre lurid greenish.

Length 62, height 32, diam. 19 mm.

River Napo, Ecuador.

Anodonta napoensis Lea, Pr. Ac. N. Sci. Phila., XII, 1868, p. 162; Jl. Ac. N. Sci. Phila., VI, 1868, p. 324, pl. LIII, fig. 137; Obs., XII, 1869, p. 84, pl. LIII, fig. 137.—Clessin, Conch. Cab. Ano., 1873, p. 116, pl. XXXIV, figs. 3. 4.

Margaron (Anodonta) napoensis Lea, Syn., 1870, p. 80.

Glabaris napoensis Simpson, Syn., 1900, p. 920.

The figured type of this species is a single right valve in the collection of the National Museum and is a singular shell. It is very solid, very dark, and most peculiarly and delicately sculptured. The dorsal outline is much more strongly curved than is that of the base. The hinge has been ground away but it is apparently edentulous. Lea has other shells, which he refers to this species, which I think are something else.

Anodontites tortilis (Lea).

Shell subrhomboid, convex, scarcely subsolid, inequilateral; beaks only moderately full and elevated; anterior end somewhat narrowed, rounded; dorsal outline arched; dorsal slope obliquely truncated; base curved, often quite full behind the middle; surface with irregular growth lines; epidermis much wrinkled and looped, the loopings often disposed in a radial manner; that of the posterior end usually concentrically lamellose; greenish-yellow or yellowish-green, often dull and dirty colored; nacre bluish, sometimes a little lurid; muscle scars shallow.

Length 70, height 47, diam. 25 mm.

Cartagena, Colombia; British Guiana; Isthmus of Darien; Nicaragua; Costa Rica.

Anodonta tortilis Lea, Tr. Am. Phil. Soc., X, 1852, p. 291, pl. XXVIII, fig. 54; Obs., V, 1852, p. 47, pl. XXVIII, fig. 54.—Clessin, Conch. Cab. Ano., 1875, p. 166, pl. LV, figs. 7, 8.

Margaron (Anodonta) tortilis Lea, Syn., 1852, p. 47; 1870, p. 75.

Anodon tortilis Sowerby, Conch. Icon., XVII, 1870, pl. XXXVII, fig. 154.

Glabaris tortilis Simpson, Syn., 1900, p. 920.

Anodonto luteola LEA, Pr. Ac. N. Sci. Phila., II, 1858, p. 118; Jl. Ac. N. Sci. Phila., IV, 1860, p. 267, pl. XLIII, fig. 147; Obs., VII, 1860, p. 85, pl. XLIII, fig. 147.—CLESSIN, Conch. *Cab.* Ano., 1874, p. 122, pl. XXXVII, figs. 1, 2.

Margaron (Anodonta) luteola LEA, Syn., 1870, p. 83.

Anodon luteolus SOWERBY, Conch. Icon., XVII, 1870, pl. XXXIII, fig. 132.

Glabaris luteolus SIMPSON, Syn., 1900, p. 920.

Anodon schomburgianus SOWERBY, Conch. Icon., XVII, 1870, pl. XXXIV, fig. 137.

Glabaris schomburgianus SIMPSON, Syn., 1900, p. 920.

Anodonta schomburghiana CLESSIN, Conch. Cab. Ano., 1876, p. 235, pl. LXXVII, fig. 4.

The type of *Anodonta tortilis* is a young shell somewhat eroded and greenish-tinted at the umbonal region. That of *A. luteola* is a nearly adult shell without any of the green color at the umboes and unworn. The examination of additional material since writing the Synopsis has convinced me that the two are identical. The species is shorter in proportion to its height than *crispatus* or *philippianus*. I believe now that *A. schomburgianus* is only a yellowish variety of the above. The ridge which Sowerby figures and mentions on the posterior slope is sometimes present in *A. tortilis*.

ANODONTITES STREBELII (Lea.)

Shell irregularly obovate, subcompressed, thin, inequilateral; beaks moderately developed; posterior ridge rounded; dorsal line lightly arched; anterior end narrowed, rounded; base curved, fuller behind the middle; dorsal slope obliquely truncate; surface with delicate growth lines; epidermis with fine, loop-like wrinkles arranged in radial rows, shining, yellowish-green with very numerous, faint, green rays; nacre deep blue, slightly lurid, with feeble, radial sculpture; muscle scars shallow.

Length 40, height 23, diam. 13 mm.

Mexico.

Anodonta strebelii LEA, Pr. Ac. N. Sci. Phila., XX, 1868, p. 150; Jl. Ac. N. Sci. Phila., VII, 1868, p. 322, pl. LII, fig. 135; Obs., XII, 1869, p. 82, pl. LII, fig. 135.—CLESSIN, Conch. Cab. Ano., 1874, p. 138, pl. XLII, figs. 5, 6.

Margaron (Anodonta) strebelii LEA, Syn., 1870, p. 79.

Glabaris strebelii SIMPSON, Syn., 1900, p. 920.

This species was founded on a single, evidently young specimen, whose soft parts Dr. Lea examined. Both shell and anatomy go to show that it is an *Anodontites* and not an *Anodonta*. The shell is shining and appears rather dark, probably on account of the dark nacre.

ANODONTITES CYLINDRACEUS (Lea).

Shell long obovate or rhomboid, scarcely subsolid, convex, inequilateral; dorsal outline lightly curved, base nearly straight; anterior end narrowed and rounded; posterior end obliquely subtruncate above, rounded below; beaks rather low; surface with irregular growth lines; epidermis with faint, loop-like wrinkles arranged in radiating rows, scarcely wrinkled behind the middle of the shell, tawny green with delicate, faint, darker rays, somewhat shining; nacre bluish, violet-tinted and richly iridescent.

Length 40, height 20, diam. 12 mm.
Length 57, height 32, diam. 19 mm.
Medellin River, Mexico.

Margarita (Anodonta) cylindracea LEA, Syn., 1836, p. 54; 1838, p. 32.

Anodonta cylindracea LEA, Tr. Am. Phil. Soc., VI, 1838, p. 45, pl. XIII, fig. 40; Obs., II, 1838, p. 45, pl. XIII, fig. 40.—CLESSIN, Conch. Cab. Ano., 1874, p. 161, pl. LIII, figs. 5, 6.—FISCHER and CROSSE, Miss. Sci., II, 1894, p. 528.—VON MARTENS, Biol. Cent. Amer., Moll., 1900, p. 535.

Anodon cylindracea SOWERBY, Conch. Icon., XVII, 1869, pl. XXIV, fig. 93.

Margaron (Anodonta) cylindracea LEA, Syn., 1852, p. 51; 1870, p. 82.

Glabaris cylindraceus SIMPSON, Syn., 1900, p. 920.

I have only seen a single shell of this, the one whose measurements are first given, and this was presented to Dr. Lea by Dr. Burroughs. According to Dr. Lea it is a thin shell but the figure shows it to be somewhat solid. It is a more elongate and more decidedly rhomboid species than the nearly related *A. strebelii.*

Fischer and Crosse, (l. c.), separate the forms figured by Sowerby in the Conchologia Iconica as var. *subarcuatula.* But von Martens, (l. c.), remarks that "there is no reason to give it a distinct name."

ANODONTITES LIMNOICUS (d'Orbigny).

Shell slightly obovate, subrhomboid, convex or subinflated, rather thin, inequilateral; beaks moderately full, and elevated; dorsal outline lightly curved; anterior end narrowed, rounded, sometimes cut away a little below; base rounded, sometimes a little fuller behind the middle; dorsal slope obliquely truncate; posterior ridge rounded or faintly biangulate, ending at or below the median line, often in a feeble biangulation; epidermis greenish or brownish, often banded, sometimes with a dark ray or two on the posterior end, smooth; nacre purplish.

Length 55, height 30, diam. 22 mm.

Length 60, height 35, diam. 20 mm.

Patagonia, north to the Amazon; west to Bolivia.

Anodonta limnoica d'ORBIGNY, Guer. Mag., 1835, p. 40; Voy. Am. Mer., 1843, p. 619, pl. LXXIX, figs. 1-3—CLESSIN, Conch. Cab. Ano., 1874, p. 129, pl. XLI, figs. 3, 4.

Anodon limnoica CATLOW and REEVE, Conch. Nom., 1845, p. 67.

Margarita (Anodonta) limnoica LEA, Syn., 1838, p. 30.

Margaron (Anodonta) limnoica LEA, Syn., 1852, p. 50; 1870, p. 79.

Glabaris limnoicus SIMPSON, Syn., 1900, p. 921.

Anodonta lymnoica CHENU, Ill. Conch., 1858, pl. III, figs. 1, 1*a*, 1*b*.

Anodonta puelchana d'ORBIGNY, Guer. Mag., 1835, p. 40; Voy. Am. Mer., 1843, p. 620, pl. LXXIX, figs. 7-9.—CHENU, Ill. Conch., 1858, pl. III, figs. 7, 7*a*.—CLESSIN, Conch. Cab. Ano., 1874, p. 130, pl XLI, figs. 5, 6.

Margaron (Anodonta) puelchana LEA, Syn., 1852, p. 51; 1870, p. 81.

Glabaris puelchanus SIMPSON, Syn., 1900, p. 921.

Anodontites puelchanus PILSBRY, Princeton Univ. Exp., III, 1911, p. 109.

Anodonta obtusula HUPÉ, Moll. Nouv., III, 1857, p. 87, pl. XVII, fig. 3.—CLESSIN, Conch. Cab. Ano., 1875, p. 214, pl. LXVI, fig. 2.

Anodon obtusula SOWERBY, Conch. Icon., XVII, 1868, pl. XX, fig. 81.

Margaron (Anodonta) obtusula LEA, Syn., 1870, p. 79.

Glabaris obtusula VON IHERING, Arch. für Nat., 1893, p. 119.

Since writing the Synopsis I have seen a set of shells, which shows considerable variation, and seems to stand partly between the *A. limnoicus* and *A. puelchanus* of d'Orbigny. The figures of the two show but little real difference, the latter being a little more inflated in the ventral region and not so distinctly banded as the former.

ANODONTITES LUCIDUS (d'Orbigny).

Shell oblong, subrhomboid, subinflated, thin, with a yellow-green epidermis, which is smooth and shining and is marked more or less with broken rays on the anterior part and entire ones on the posterior part; beaks high, rather sharp; dorsal and basal lines curved, the latter more so; anterior end rounded; dorsal slope obliquely truncate; posterior ridge somewhat double, ending in a feeble biangulation; nacre blue with dark, zigzag markings.

Length 50, height 25, diam. 15 mm.

Uruguay.

Anodonta lucida d'ORBIGNY, Guer. Mag., 1835, p. 40; Voy. Am. Mer., 1843, p. 620, pl. LXXIX, fig. 4-6.—CHENU, Ill. Conch., 1858, pl. III, figs. 6, *6a*, *6b*.—CLESSIN, Conch. Cab. Ano., 1875, p. 208, pl. LXIX, figs. 4, 5.

Margaron (Anodonta) lucida LEA, Syn., 1852, p. 51; 1870, p. 82.

Glabaris lucidus SIMPSON, Syn., 1900, p. 921.

This differs from *limnoicus* by its higher beaks, the system of rays broken and entire and by the zigzag, internal markings, which appear to be somewhat like those often seen in *A. trapesialis* and its allies.

ANODONTITES INCARUM (Philippi).

Shell almost evenly long elliptical subinflated, subsolid, somewhat inequilateral; beaks considerably elevated; posterior ridge well developed, rounded, with a radial groove above it; hinge line lightly arched; anterior end rounded; base rounded, sometimes a little fuller behind the middle; posterior end obliquely subtruncate above, narrowly rounded below; surface irregularly and regularly striate; epidermis greenish; nacre flesh-color or salmon-tinted.

Length 52, height 31, diam. 19 mm.

Peru.

Anodonta incarum PHILIPPI, Mal. Bl., XVI, 1869, p. 40.—PFEIFFER, Nov. Conch., III, 1869, p. 488, pl. CV, figs. 9-11.

Glabaris incarum SIMPSON, Syn., 1900, p. 921.

The shell is elliptical or very slightly subrhomboid, while that of *A. philippianus*, to which it is allied, is decidedly rhomboid or trapezoid.

ANODONTITES HOLTONIS (Lea).

Shell oblong, somewhat rhomboid, thin, subinflated, inequilateral; beaks full and elevated; anterior end narrowed, rounded above, cut away below; dorsal and base lines nearly straight; posterior end obliquely truncate above, rounded below; surface with irregular growth lines; epidermis with widely spaced, radial rows of loop-like wrinkles, dirty greenish, with several broad, feeble, dark rays behind, subshining; nacre blue, slightly iridescent behind; muscle scars shallow.

Length 68, height 34, diam. 23 mm.

Colombia.

Anodonta holtonis LEA, Pr. Ac. N. Sci. Phila., I, 1857, p. 85; Jl. Ac. N. Sci. Phila., III, 1857, p. 316, pl. XXXII, fig. 31; Obs., VI, 1847, p. 36, pl. XXXII, fig. 31.—CLESSIN, Conch. Cab. Ano., 1874, p. 149, pl. L, figs. 5, 6.

Anodon holtonis SOWERBY, Conch. Icon., XVII, 1870, pl. XXXVI, fig. 147.

Margaron (Anodonta) holtonis LEA, Syn., 1870, p. 79.

Glabaris holtonis SIMPSON, Syn., 1900, p. 921.

A thin, oblong, somewhat rhomboid, subinflated species with a dirty green epidermis. The beaks are higher than are those of *cylindraceus* and the shell is thinner and only rayed behind.

Group of *Anodontites inæquivalvis.*

Shell elliptical, moderately solid and inflated, with a low posterior ridge, slightly produced behind near the base and truncated above the posterior slope; beaks full, smooth; ligament imbedded in a sort of groove, which extends to the anterior point of the shell; epidermis slightly roughened, often cloth-like, and showing the rest periods, having faint, radiating lines; nacre bluish, soft, but not brilliant.

Animal unknown.

ANODONTITES INÆQUIVALVIS (Lea).

Shell small, slightly inequivalve, inequilateral, subelliptical or subrhomboid, convex, scarcely subsolid; anterior end rounded, sometimes slightly cut away below; dorsal and basal regions rounded; posterior end obliquely subtruncate above; surface with irregular growth lines; epidermis having concentric, delicate folds, which are more or less looped, the loops arranged in radial rows, greenish, tawny or straw-color, sometimes faintly rayed; nacre bluish, greenish-blue or flesh-color, bright and iridescent.

Length 42, height 28, diam. 17 mm.

Length 35, height 24, diam. 15 mm.

Lake Nicaragua; Mexico.

Anodonta inæquivalvis LEA, Pr. Ac. N. Sci. Phila., XII, 1868, p. 95; Jl. Ac. N. Sci. Phila., VI, 1868, p. 292, pl. XLIII, fig. 108; Obs., XII, 1869, p. 52, pl. XLIII, fig. 108.—CLESSIN, Conch. Cab. Ano., 1874, p. 137, pl. XLIV, figs. 7, 8.

Margaron (Anodonta) inæquivalvis LEA, Syn., 1870, p. 83.

Glabaris inæquivalvis SIMPSON, Syn., 1900, p. 922.

Anodonta lenticularis LEA, Pr. Ac. N. Sci. Phila., XII, 1868, p. 95; Jl. Ac. N. Sci. Phila., VI, 1868, p. 290, pl. XLI, fig. 102; Obs., XII, 1869, p. 50, pl. XLI, fig. 102.—CLESSIN, Conch. Cab. Ano., 1874, p. 134, pl. XLIII, figs. 5, 6.

Margaron (Anodonta) lenticularis LEA, Syn., 1870, p. 81.

Anodonta inequivalvis lenticularis VON MARTENS, Biol. Cent. Amer., Moll., 1900, p. 534.

Anodon glabrus SOWERBY, Conch. Icon., XVII, 1870, pl. XXV, fig. 97.

Anodon montezianus SOWERBY, Conch. Icon., XVII, 1870, pl. XXXVI, fig. 145.

Anodonta viridana CLESSIN, Conch. Cab. Ano., 1876, p. 226, pl. LXXV, fig. 5.

A large number of specimens of this species are before me and they show a considerable amount of variation in form and color. In the type the left valve is a little higher than the right, but this character is not constant. I do not think that Lea's *Anodonta lenticularis*, the type of which is before me, differs even varietally.

ANODONTITES GRANADENSIS (Lea).

Shell elliptic rhomboid, convex, inequilateral, scarcely subsolid, the outline being almost evenly elliptical except that the dorsal slope is somewhat obliquely truncated; posterior ridge full, rounded; epidermis concentrically striate, slightly wrinkled and looped, deep green with a straw-colored area at the base of the shell in front of the posterior ridge, and occasionally two or three posterior rays; nacre blue, purplish or flesh-colored, iridescent.

Length 36, height 22, diam. 14 mm.

Lake Nicaragua, Central America.

Anodonta granadensis LEA, Pr. Ac. N. Sci. Phila., XII, 1868, p. 96; Jl. Ac. N. Sci. Phila., VI, 1868, p. 288, pl. XLI, fig. 100; Obs., XII, 1869, p. 48, pl. XLI, fig. 100.—CLESSIN, Conch. Cab. Ano., 1874, p. 134, pl. XLIV, figs. 3, 4.

Margaron (Anodonta) granadensis LEA, Syn., 1870, p. 81.

Glabaris granadensis SIMPSON, Syn., 1900, p. 922.

Anodonta inæquivalvis granadensis VON MARTENS, Biol. Cent. Amer., Moll., 1900, p. 535.

Probably only a variety of *inequivalvis* but rather more elongate in outline, more delicate and having generally, though not always, a pale flush at the base of the shell in front of the posterior ridge. Sometimes this buff color is extended around the outer edge of the shell as a band.

ANODONTITES DEPEXUS (von Martens).

"Shell solid, ovate-rhomboid, rather convex, sculptured with light, radiating grooves and concentric, frilled striæ, olivaceous; beaks not prominent; shortly rounded in front; dorsal margin straight, slightly ascending; postero-dorsal angle obtuse; ventral margin somewhat curved; posterior end subrostrate, oblique above, rounded below; nacre pale bluish, very iridescent towards the margin, edge of margin black; sinulus triangular, anterior margin almost perpendicular.

Length 67, height 41.5, alæ 45, diam. 24 mm. Vertices in 1-3 long.

Length 64, height 39.5, alæ 45, diam. 23.5 mm. Vertices in 1-3 long.

Length 46, height 29, alæ 31, diam. 16 mm. Vertices in 1-3 long." (von Martens).

Type locality, Paso Antonio, Rio Michatoya, W. Guatemala.

Anodonta depexa VON MARTENS, Biol. Cent. Am., Moll., 1900, p. 538, pl. LXI, figs. 3, 3*a-c*.

"Three specimens of nearly equal size and a younger one are before me, all having shallow furrows radiating from the summits towards the ventral margin, which cut the concentric striæ of growth and cause them to become more or less frilled; in the fore and hinder parts of the shell these furrows are not to be seen, and in the hinder part, at a determined line, they disappear and the concentric lines become simple, more crowded, and somewhat membranaceous and projecting, the appearance here being more dull and dirty, contrasting with the somewhat shining olivaceous color of the middle and fore parts. This peculiarity is visible in all four examples, but in a somewhat different degree; whether it is due to the structure of the periostracum, or caused by the fore and middle parts of the length being more worn than the hinder part, it is impossible to tell. I know of no other *Anodonta* or *Glabaris* with similar structure; the general form and solidity of the shell, as well as the well-marked, dull, (lustreless), marginal zone, prove that it belongs to the South American group of *Anodonta latemarginata* Lea."

This species may be only a form of *inæquivalvis*, from which it seems to differ mostly in its larger size and the greater solidity of its shell.

ANODONTITES TEHUANTEPECENSIS (Crosse and Fischer).

"Shell inequilateral, oval, slightly inflated, quite solid, covered with a greenish-brown epidermis, without rays, with fine, concentric striæ, which become sublamellose posteriorly and near the ventral margin; anterior side curved; posterior side obliquely and obtusely subtruncate; ventral margin regularly curved; dorsal margin nearly straight, slightly ascending behind the beaks, which are small and eroded; dorsal slope somewhat compressed and obscurely bounded by an obliquely descending depression. Nacre bluish-white and iridescent; adductor muscular impressions superficial. Ligament narrow.

Length 56, height 37, diam. 19.5 mm." (Crosse and Fischer).

Type locality, Cacoprieto, Isthmus of Tehuantepec, State of Oajaca, Mexico.

Anodonta tehuantepecensis CROSSE and FISCHER, Jl. Con., XLI, 1893, p. 32.—FISCHER and CROSSE, Miss. Sci., II, 1894, p. 526, pl. LXX, figs. 1-1*a*.

Glabaris tehuantepecensis SIMPSON, Syn., 1900, p. 933.

"We have seen only a single specimen of this species, which is distinguished from its allied forms by its regularly oval shape and its rather solid shell."

ANODONTITES TRAUTWINIANUS (Lea).

Shell elliptic rhomboid, scarcely subsolid, convex or subinflated, inequilateral; beaks moderately full and elevated; posterior ridge rounded, ending in a blunt point near the base of the shell; dorsal and ventral outlines rounded; anterior end round; dorsal slope obliquely truncate; surface with irregular growth lines; epidermis dull, somewhat cloth-like, often with faint, radial, thread-like lines, greenish or brownish, occasionally with yellowish bands; nacre flesh-color, or bluish-tinted, bright and iridescent; muscle scars faint.

Length 78, height 45, diam. 28 mm.

Cartagena, Colombia.

Anodonta trautwiniana LEA, Tr. Am. Phil. Soc., X, 1852, p. 287, pl. XXVI, fig. 48; Obs., V, 1852, p. 43, pl. XXVI, fig. 48.

Margaron (Anodonta) trautwiniana LEA, Syn., 1870, p. 81.

Anodon trautwinianus SOWERBY, Conch. Icon., XVII, 1870, pl. XXXIII, fig. 134.

Margaron (Anodonta) troutwiniana LEA, Syn., 1852, p. 51.

Glabaris trautwinianus SIMPSON, Syn., 1900, p. 922.

Anodonta troutwiniana CLESSIN, Conch. Cab. Ano., 1874, p. 112, pl. XXXVI, figs. 1, 2.

? Anodon ovatus SWAINSON, Ex. Conch., 1841, pl. XXXVI.

? Anodonta carthagena ——, Who? Where?

This species seems to be almost equally related to this group, to that of *crispatus* and that of *trapesialis*.

ANODONTITES MONTEZUMA (Lea).

Shell almost regularly short elliptical, convex, inequilateral; thin; beaks full but not greatly elevated; anterior end a little narrowed, rounded, slightly cut away below; dorsal and basal lines rounded, the latter full just behind the middle; posterior end rounded, very slightly produced about on the median line; epidermis rough, yellow and green; anterior scars distinct; posterior scars confluent; nacre white and iridescent.

Length 42, height 29, diam. 13 mm.

Central America.

Anodonta montezuma LEA, Pr. Am. Phil. Soc., II, 1841, p. 31; Tr. Am. Phil. Soc., 1842, p. 240, pl. XXIII, fig. 55; Obs., III, 1842, p. 78, pl. XXIII, fig. 55.—CLESSIN, Conch. Cab. Ano., 1876, p. 220, pl. LXXII, figs. 7, 8.

Margaron (Anodonta) montezuma LEA, Syn., 1852, p. 51; 1870, p. 82.

Glabaris montezuma SIMPSON, Syn., 1900, p. 923.

This may be a true *Anodonta* related to *A. exilior*. I have never seen it and the description is rather brief, while the figures give no characters by which I can decide. It is very slightly obovate, thin, with a rough yellow and green epidermis.

Group of *Anodontites trapesialis*.

Shell large, inflated, elliptical, narrower in front, with full, rather prominent beaks, a slight wing on the post-dorsal part, and sometimes a small one in front of the beaks; gaping decidedly in front and slightly behind; epidermis smooth, generally uniform olive-green; hinge line straight or slightly sinuous; escutcheon large and conspicuous; nacre bluish-silvery, sometimes marked with parallel, wavy dark lines.

Animal with the marsupium filling the inner branchiæ; gills large, inner the larger; palpi very large, reniform; mantle thin, with a wide, thickened edge; branchial opening small, plicate, but not crenulate or papillose; anal opening large, smooth, separated from the branchial by a strong bridge.

Anodontites trapesialis (Lamarck).

Shell large, subinflated, rather thin, irregularly obovate or subtrapezoid, inequilateral; beaks large, full and elevated; hinge line nearly straight, usually slightly arched; anterior end narrowed, rounded, subangulate above, often slightly cut away below; base line rounded, frequently fuller just behind the middle; posterior end obliquely truncate above, rounded or drawn out to a blunt point at or below the median line; surface with light growth lines; epidermis yellowish-green, greenish-tawny to ashy-green, darker and often broadly, faintly rayed on the dorsal slope, sometimes feebly rayed on the disk; dull or subshining; nacre bluish to flesh-color, generally iridescent behind; pallial line often having a faint, posterior sinus; muscle scars shallow.

Length 145, height 82, diam. 53 mm.

Length 120, height 72, diam. 46 mm.

Tropical South America from Brazil and Peru southward.

Anodonta trapesialis Lamarck, An. sans. Vert., VI, 1819, p. 87.

Iridina trapesialis d'Orbigny, Guer. Mag., 1835, p. 43.

Glabaris trapesialis PILSBRY, Pr. Ac. N. Sci. Phila., 1896, p. 563.—SIMPSON, Syn., 1900, p. 923.

Anodonta trapezialis BLAINVILLE, Man. de Mal. et Conch., 1825, p. 538, fig. I.—DESHAYES, Enc. Meth., II, 1827, p. 147, pl. CCV, fig. I.—WYATT, Man. Conch., 1838, p. 68, pl. XI, fig. 3.—KUSTER, Conch. Cab. Ano., 1853, p. 31, pl. VII, fig. 4.—CLESSIN, Conch. Cab. Ano., 1876, p. 235, pl. LXXVII, fig. 5.

Anodon trapezialis CROUCH, Ill. Int. Lam., 1827, p. 16, pl. IX, fig. 7.

Margarita (Anodonta) trapezialis LEA, Syn., 1836, p. 53; 1838, p. 31.

Margaron (Anodonta) trapezialis LEA, Syn., 1852, p. 52; 1870, p. 82.

Columba trapezialis PÆTEL, Conch. Sam., III, 1890, p. 188.

Anodon giganteus SPIX (part), Test. Fluv. Bras., 1827, p. 27, pl. XIX, fig. 2.

Anodon gigantea SOWERBY, Conch. Icon., XVII, 1867, pl. VIII, fig. 18.

Anodonta gigantea VON MARTENS, Mal. Bl. XV, 1868, p. 196.

Columba gigantea PÆTEL, Conch. Sam., III, 1890, p. 188.

? *Anodon penicillatus* GRAY, Pr. Zool. Soc. Lond., 1834, p. 57.

Anodonta penicillata H. and A. ADAMS, Gen. Rec. Moll., II, 1857, p. 503.

Anodon susannæ GRAY in Griffith, Cuv., XII, 1834, pl. XXIV, fig. I.—SOWERBY, Conch. Icon., XVII, 1867, pl. IX, fig. 21.

Anodonta susannæ PÆTEL, Conch. Sam., III, 1890, p. 185.

Anodon ciconia GOULD, Pr. Bost. Soc. Nat. Hist., IV, 1851, p. 92.

Anodon blainvilleana SOWERBY, Conch. Icon., XVII, 1867, pl. VI, fig. 2.

A fine, abundant, widely distributed and very variable species. The figure in the Encyclopedie Methodique is from a shell with evenly rounded lines, the posterior end being rather squarely truncate above and widely rounded below. The base shows no traces of angulation behind the middle. The anterior base of the shell usually gapes widely and there is a slight gape at the edge of the dorsal slope.

Var. *anserinus* (Spix).

Shell elongated, considerably narrowed in front, full and often subangulate behind the middle of the base.

Anodon anserinus Spix, Test. Fluv. Bras., 1827, p. 29, pl. xvii, figs. 1, 2.—Sowerby, Conch. Icon., XVII, 1870, pl. xxxi, fig. 125.

Anodon anserina Catlow and Reeve, Conch. Nom., 1845, p. 66.

Margarita (Anodonta) anserina Lea, Syn., 1838, p. 31.

Anodonta anserina Chenu, Man., 1859, II, p. 146.—Clessin, Conch. Cab. Ano., 1873, p. 80, pl. xx, fig. 1.

Margaron (Anodonta) anserina Lea, Syn., 1852, p. 52; 1870, p. 83.

Glabaris trapezialis var. *anserinus* Simpson, Syn., 1900, p. 924.

This form, which is quite common, varies imperceptibly into the type.

Var. *exoticus* (Lamarck).

Shell much elongated, narrowed in front; base often incurved in front of the middle, full behind the middle; hinge line somewhat sinuous.

Anodonta exoticus Lamarck, An. sans Vert., VI, 1819, p. 87. —Delessert, Rec. Coq., Lam., 1841, pl. xiii, fig. 1.—Chenu, Ill. Conch., 1858, pl. iii, fig. 2.—Clessin, Conch. Cab. Ano., 1875, p. 178, pl. lviii, figs. 1, 2.

Anodon exotica Catlow and Reeve, Conch. Nom., 1845, p. 66.

Columba exotica Pætel, Conch. Sam., III, 1890, p. 188.

Glabaris trapesialis var. *exoticus* Simpson, Syn., 1900, p. 924.

The hinge line is arched in the posterior half and sags in the middle of the front half.

Var. *scriptus* (Sowerby).

Shell elongated, generally irregularly obovate; base full behind the middle, often a little incurved in front of the middle; epidermis chestnut; nacre with a number of dark V-shaped and zigzag markings.

Length 162, height 88 mm.

Anodon scriptus SOWERBY, Conch. Icon., XVII, 1867, pl. IV, fig. 9.

Glabaris trapesialis var. *scriptus* SIMPSON, Syn., 1900, p. 924.

Anodon subsinuatus SOWERBY, Conch. Icon., XVII, 1867, pl. VII, fig. 14.

Anodon areolatus SOWERBY, Conch. Icon., XVII, 1867, pl. X, fig. 28.

Anodonta bahiensis KUSTER, Conch. Cab. Ano., 1873, p. 94, pl. XX, fig. 2.

Glabaris bahiensis VON IHERING, Arch. für Naturg., 1893, p. 115.

Varies to forms with the ordinary colored epidermis, and to those, which almost want the dark internal markings.

Var. *rioplatensis* (Sowerby).

Shell short, decidedly pentagonal; epidermis pale olive-brown with a band near the border.

Length 110, height 73 mm.

Anodon rioplatensis SOWERBY, Conch. Icon., XVII, 1870, pl. XXVI, fig. 101.

Anodonta rioplatensis CLESSIN, Conch. Cab. Ano., 1875, p. 217, pl. LXIV, fig. 3.

Glabaris trapesialis var. *rioplatensis* SIMPSON, Syn., 1900, p. 925.

? Anodon ciconia SOWERBY, Conch. Icon., XVII, 1870, pl. XXIX, fig. 115*a*.

Var. *moretonianus* (Sowerby).

Anodon moretonianus SOWERBY, Conch. Icon., XVII, 1867, pl. IX, fig. 20.

Glabaris trapezialis var. *moretonianus* SIMPSON, Syn., 1900, p. 925.

Shell narrow, thick, oblong, anterior side very short, rounded; posterior side long, acuminated, with a narrow, distinct keel above the terminal angle, expanded into a three-cornered wing above the keel.

Perhaps a good variety.

Length 68, height 38 mm.

Var. *cygnæformis* (Pilsbry).

Shell irregularly long obovate, rather delicate and thin, not inflated; epidermis greenish or olive-green.

Length 136, height 68, diam. 37 mm.

Glabaris trapesialis var. *cygnæformis* Pilsbry, Pr. Ac. N. Sci. Phila., 1896, p. 563, pl. xxvi, fig. 4, 5.—Simpson, Syn., 1900, p. 925.

The posterior end is drawn out and bluntly pointed.

ANODONTITES RADIATUS (Spix).

Shell irregularly oblong, thin and fragile, compressed, pellucid, inequilateral; dorsal outline straight; anterior end narrowed and rounded; base lightly curved in front, very full behind the middle, the outline curving up to a blunt point at the posterior end above the median line; dorsal slope obliquely truncate; beaks full, slightly elevated; surface densely, concentrically striate; epidermis glaucous-green with broad, regular, faint, darker rays; nacre bluish.

Length 65, height 33 mm.

Brazil.

Anodon radiatus Spix, Test. Fluv. Bras., 1827, p. 31, pl. xxiii, fig. 1.

Margarita (Anodonta) radiata Lea, Syn., 1836, p. 51.

Anodon radiata Catlow and Reeve, Conch. Nom., 1845, p. 67.

Margaron (Anodonta) radiatus Lea, Syn., 1870, p. 83.

Glabaris radiata von Ihering, Arch. für Nat., 1893, p. 115.

Glabaris radiatus Simpson, Syn., 1900, p. 925.

The shell figured is evidently quite young, and Wagner states that the margins are membranous. It may be only the young of a variety of *A. trapesialis*, but it is remarkably full at the base behind the middle, and I have never seen any shells of that species so rayed.

ANODONTITES SIMPSONIANUS (Pilsbry).

Shell subelliptical or slightly obovate, subinflated or inflated, solid, inequilateral; beaks long, full and elevated; posterior ridge well developed, rounded, ending in a blunt point on the median line; hinge line lightly arched behind, nearly straight in front; anterior end narrow, rounded, angled above; base line curved, a little fuller behind the middle; dorsal slope obliquely subtruncate; surface with irregular, concentric sculpture; epidermis greenish-brown, subshining; nacre flesh-color, often with letter-like or zigzag, dark markings; muscle scars impressed; pallial line remote from the border. The valves gape widely along the anterior part and slightly behind.

Length 138, height 80, diam. 60 mm.

Rio de la Plata.

Glabaris simpsonianus PILSBRY, Pr. Ac. N. Sci. Phila., 1896, p. 564, pl. XXVII, fig. 13.—SIMPSON, Syn., 1900, p. 925.

A remarkably solid, inflated species, which has a nearly evenly elliptical outline. The epidermis is more brownish than in most specimens of *A. trapesialis*.

ANODONTITES SINUOSUS (Lamarck).

Shell trapezoid, inflated, thin, inequilateral, hinge line decidedly sinuous, being arched behind the beaks and incurved in front of them; anterior end narrowed, rounded below, sharply angled above; base straight to considerably incurved medially; posterior end wide, obliquely subtruncate above, rounded below; beaks full and elevated; surface having irregular growth lines; epidermis olive-green, sometimes slightly rayed; nacre whitish or bluish-white, iridescent.

Length 85, height 53 mm.

Length 98, height 56, diam. 39 mm.

Brazil.

Anodonta sinuosa LAMARCK, An. sans Vert., VI, 1819, p. 87.—DESHAYES, Enc. Meth., II, 1827, p. 147, pl. CCIII, fig. 2.—HANLEY, Biv. Shells, 1843, p. 224, pl. XXIV, fig. 16.

Margarita (Anodonta) sinuosa LEA, Syn., 1836, p. 54; 1838, p. 32.

Anodon sinuosa CATLOW and REEVE, Conch. Nom., 1845, p. 68.

Margaron (Anodonta) sinuosa LEA, Syn., 1852, p. 53; 1870, p. 83.

Anodon sinuosus SOWERBY, Conch. Icon., XVII, 1867, pl. VIII, fig. 15.

Anodon sinuosis Swainson, Ex. Conch., 2d ed., 1841, p. 29, pl. xvi.

Glabaris sinuosus Simpson, Syn., 1900, p. 925.

The hinge line in this species is decidedly sinuous and in some cases the lunule passes back under the beaks. As in the other species of the group, the anterior base gapes. It may be only a variety of *trapesialis*.

Anodontites grijalvæ (Morelet).

Shell very large, solid, very much inflated, inequilateral, irregularly elliptical; beaks enormously large, full and high; hinge line arched behind, nearly straight or lightly incurved in front; anterior end narrowed, rounded, subangulate above; base rounded, full behind the middle; posterior end rounded, slightly more prominent on the median line; surface with rude, unequal, concentric striæ; epidermis brownish-black; nacre flesh-colored; muscle scars shallow.

Length 161, height 100, diam. 95 mm.

Tabasco, Mexico.

Anodonta grijalvæ Morelet, Jl. de Conch., XXXI, 1884, p. 12.—Fischer and Crosse, Miss. Sci., II, 1894, p. 532, pl. lxix, figs. 1, 1*a*.

Glabaris grijalvæ Simpson, Syn., 1900, p. 926.

Anodonta grijoloæ Pætel, Conch. Sam., III, 1890, p. 180.

This species, which is apparently related rather closely to *A. trapesialis*, is greatly inflated, solid, has a dark epidermis and higher, larger beaks than Lamarck's shell has.

Anodontites glaucus (Valenciennes).

Shell varying from long elliptical to somewhat short obovate, scarcely subsolid, not very inequilateral; subinflated, gaping at the anterior base and slightly behind; beaks moderately full and elevated, slightly wrinkled at the tips; hinge line arched behind the beaks, straight or a very little incurved in front of them; anterior end rounded, usually subangulate above; base rounded or lightly curved, often fuller behind the middle; dorsal slope obliquely truncate or subtruncate; posterior end pointed about on the median line; surface with delicate, often faint, concentric striæ; epidermis varying from ashy-green or yellowish-green to brownish, sometimes feebly rayed and banded; nacre bluish to flesh-color, brilliant, often slightly rayed.

Length 103, height 60, diam. 37 mm.
Length 90, height 60, diam. 37 mm.
Length 95, height 56.5, diam. 34 mm.
Length 104, height 56, diam. 35 mm.
Length 112, height 68, diam. 38 mm.

Mexico; South to Peru and Brazil.

Anodonta glauca VALENCIENNES, Rec. Obs. Zool., II, 1833, p. 236, pl. L, fig. 2.—DELESSERT, Rec. Coq. Lam., 1841, pl. XIII, fig. 3.—CLESSIN, Conch. Cab. Ano., 1876, p. 222, pl. LXXIII, fig. 1.—FISCHER and CROSSE, Miss. Sci., II, 1894, p. 533, pl. LXIX, figs. 1, 1*a*.

Margarita (Anodonta) glauca LEA, Syn., 1836, p. 51; 1838, p. 30.

Anodon glauca CATLOW and REEVE, Conch. Nom., 1845, p. 67.

Margaron (Anodonta) glauca LEA, Syn., 1852, p. 50; 1870, p. 80.

Monocondylæa glauca H. and A. ADAMS, Gen. Rec. Moll., II, 1857, p. 501.

Glabaris glaucus SIMPSON, Syn., 1900, p. 926.

Anodonta burroughiana CHENU (part), Ill. Conch., 1858, pl. III.

This is apparently a widely distributed and very variable species. It varies from long elliptical to a rather short obovate form and there is considerable difference in the degree of inflation and the color of the epidermis. I cannot separate specimens before me, from Colombia, South America, from this species, as they agree essentially with shells in the Stearns Collection from Mazatlan, Mexico. Lea has a young shell in his collection from Brazil, which he has labeled "*Anodonta glauca* Valen.," which is probably the same. The species is generally of finer texture, is smoother externally and has a more brilliant nacre than *A. trapesialis,* to which it is closely allied.

Var. *sinaloensis* (Crosse and Fischer).

Subcompressed, epidermis shining, thin, pale olivaceous-fuscous, scarcely radiate; nacre pale salmon-rose with white border.

Length 106, height 52, diam. 36 mm.

Rio Presidio, Sinaloa, Mexico.

Anodonta glauca var. *sinaloensis* CROSSE and FISCHER, Jl. de Conch., XXXI, 1883, p. 219.

Glabaris glaucus var. *sinaloensis* SIMPSON, Syn., 1900, p. 926.

Anodon glaucus SOWERBY, Conch. Icon., XVII, 1870, pl. XXVII, fig. 105.

Anodonta ciconia CARPENTER, Maz. Shells, 1857, p. 117.—FISCHER and CROSSE, Miss. Sci., II, 1894, p. 534, pl. LXXVIII, figs. 2-2*a*.—VON MARTENS, Biol. Cent. Amer., Moll., 1900, p. 536, pl. XLI, fig. 4.

Possibly worthy of a varietal name. There is a single valve from "New Granada" contributed by Gibbon, in the Lea Collection, which agrees pretty closely with the description of Crosse and Fischer.

ANODONTITES UMBONATUS (Simpson).

Shell irregularly long rhomboid, inflated, somewhat inequilateral: thin; beaks enormously large, full and high; hinge line lightly curved; anterior end rounded, angled above; base slightly incurved in the middle; posterior end obliquely truncate above, squarely truncate below; posterior ridge widely, faintly double; surface with strong growth lines; epidermis mud-colored; nacre white.

Length (of figure) 146, height 90 mm.

Locality unknown.

Anodon ciconia SOWERBY (part), Conch. Icon., XVII, 1870, pl. XXIX, fig. 115*b*.

Glabaris umbonatus SIMPSON, Syn., 1900, p. 926.

Sowerby has given two figures of what he calls *Anodon ciconia* Gould. One of these is probably a young *A. trapesialis*, the other is from a large shell of a totally different species.

This seems to be, perhaps, more closely related to *A. forbesianus* than anything else, but is more rhomboid, more inflated, has much larger and more prominent beaks and different epidermis.

ANODONTITES BRIDGESII (Lea).

Shell oblong, subelliptical, scarcely subinflated, somewhat inequilateral, rather thin; beaks moderately full, but little elevated; hinge line almost straight, very slightly arched; anterior end rounded, almost as wide as the posterior end, subangulate above; base incurved medially in adult or old shells; posterior end rounded, a little drawn out on the median line; surface with irregular growth lines; epidermis dull greenish or brownish-green, darker on the dorsal slope, occasionally faintly rayed; nacre brilliant silvery and iridescent, bluish, greenish or flesh-colored, sometimes salmon-tinted within the cavities, often faintly radially sculptured.

Length 132, height 68, diam. 42 mm.

Nicaragua; Honduras.

Anodonta bridgesii LEA, Pr. Ac. N. Sci. Phila., XII, 1868, p. 95; Jl. Ac. N. Sci. Phila., VI, 1868, p. 291, pl. XLII, fig. 104; Obs., XII, 1869, p. 51, pl. XLII, fig. 104.—CLESSIN, Conch. Cab. Ano., 1874, p. 136, pl. LXV, figs. 1, 2.

Margaron (Anodonta) bridgesii LEA, Syn., 1870, p. 81.

Glabaris bridgesii SIMPSON, Syn., 1900, p. 926.

More elongated than *umbonatus* and almost evenly rounded behind. The beaks are very much lower than in that species. By an error the artist has made the type of Lea's species biangulate behind. The shell is almost evenly rounded. It is more elongated than *A. forbesianus*, is scarcely narrowed in front, and is not truncate behind as that species is.

ANODONTITES JEWETTIANUS (Lea).

Shell long rhomboid, inflated, thin to subsolid, slightly inequilateral; beaks full and elevated; hinge line lightly arched, sometimes a little sinuate; anterior end more or less cut away below, rounded above and angular where it joins the hinge line; base straight or curved; posterior end obliquely truncate above, rounded below; surface sculptured with fine, even growth lines; epidermis ashy-brownish or ashy-greenish, darker on the posterior end and sometimes at the anterior end; nacre greenish-bluish or flesh-colored, sometimes salmon in the cavities.

Length 108, height 62, diam. 45 mm.

Lake Nicaragua.

Anodonta jewettiana LEA, Pr. Ac. N. Sci. Phila., XII, 1868, p. 95.

Glabaris jewittianus SIMPSON, Syn., 1900, p. 927.

Anodonta jewettii LEA, Jl. Ac. N. Sci. Phila., VI, 1869, p. 289, pl. XLI, fig. 101; Obs., XII, 1869, p. 49, pl. XLI, fig. 101.—CLESSIN, Conch. Cab. Ano., 1874, p. 135, pl. XLIV, figs. 1, 2.

Margaron (Anodonta) jewettii LEA, Syn., 1870, p. 81.

A very large series of shells of this species is before me, including the type, which is more strongly cut away at the anterior base than is the case in most specimens. As a rule the shells are more inflated then those of *G. bridgesii,* are more regularly rhomboid, and are paler in color, but there are intermediates, which approach both forms. The close, delicate, concentric sculpture seen in the type is not absolutely constant. Like the other species of the group the shell gapes at the anterior base and is slightly open behind. I have seen a few shells with faint, radial sculpture.

ANODONTITES FORBESIANUS (Lea).

Shell trapezoid, somewhat inflated, subsolid, slightly inequilateral; beaks rather full and high; hinge line lightly arched; anterior end narrowed, rounded, angled above; base nearly straight or lightly curved; posterior end almost squarely truncated; surface with feeble, concentric striæ; epidermis pale brown, sometimes tinted with green and banded with burnt brown, dark on the dorsal slope, shining; nacre bluish-white; muscle scars somewhat impressed.

Length 116, height 70, diam. 50 mm.

Uruguay; Peru.

Anodonta forbesiana LEA, Pr. Ac. N. Sci. Phila., IV, 1860, p. 92; Jl. Ac. N. Sci. Phila., V, 1863, p. 393, pl. XLVII, fig. 301; Obs., X, 1863, p. 29, pl. XLVII, fig. 301.—CLESSIN, Conch. Cab. Ano., 1873, p. 115, pl. XXXIV, figs. 1, 2.

Anodon forbesianus SOWERBY, Conch. Icon., XVII, 1870, pl. XXX, fig. 119.

Margaron (Anodonta) forbesiana LEA, Syn., 1870, p. 81.

Glabaris forbesianus SIMPSON, Syn., 1900, p. 927.

More trapezoidal than *umbonatus;* the base is not so straight; the epidermis is brownish, with faint, dark bands, instead of mud colored, and it is more squarely truncate behind. It gapes slightly behind, and widely at the anterior base.

ANODONTITES MORICANDII (Lea).

Shell long trapezoid, scarcely inflated, rather thin, gaping at the front, the anterior base and the hinder end, inequilateral; beaks moderately elevated and inflated; hinge line straight or slightly incurved, developed into a low wing behind; anterior end rounded, narrowed a little and cut away somewhat below; base curved, straight or even a little incurved medially; posterior end with a long, oblique truncation above, narrowly rounded below; surface with uneven, concentric sculpture, the ridges sometimes disposed to be granulous; epidermis shining, pale ashy-green, darker on the dorsal slope; nacre bright bluish, silvery and iridescent; muscle scars shallow.

Length 117, height 70, diam. 35 mm.

Brazil.

Anodonta moricandii LEA, Pr. Ac. N. Sci. Phila., IV, 1860, p. 90; Jl. Ac. N. Sci. Phila., V, 1863, p. 396, pl. XLIX, fig. 303; Obs., X, 1863, p. 32, pl. XLIX, fig. 303.—CLESSIN, Conch. Cab. Ano., 1874, p. 114, pl. XXXVIII, figs. 3, 4.

Anodon moricandii SOWERBY, Conch. Icon., XVII, 1870, pl. XXXII, fig. 126.

Margaron (Anodonta) moricandii LEA, Syn., 1870, p. 81.

Glabaris moricandii VON IHERING, Arch. für Nat., 1893, p. 115. —SIMPSON, Syn. 1900, p. 927.

? *Anodon exoticus* SOWERBY, Conch. Icon., XVII, 1867, pl. XVI, fig. 57.

Anodonta angustata CLESSIN, Conch. Cab. Ano., 1876, p. 226, pl. LXXIV, figs. 6, 7.

Anodonta hertwigii VON IHERING, Arch. für Nat., 1890, p. 150, pl. IX, fig. 7.

Glabaris hertwigii SIMPSON, Syn., 1900, p. 925.

A fine series of this species is now before me and a careful study of it convinces me that von Ihering's *Anodonta hertwigii* is the same. He gives a very rough outline figure of his species, in which the ventral region is incurved medially, and refers to the figure and description of *A. anserina* in the New Conchylien Cabinet. In the figure in that work the base of the shell is considerably produced medially, but I am now convinced that it is the same as Lea's *moricandii*. A dorsal view of this shell shows the sides to be flattened and nearly parallel.

Group of *Anodontites georginæ*.

Shell subsolid, obovate, with a decided, curved posterior ridge, and a smaller one above it, the space between the ridges a shallow groove.

ANODONTITES GEORGINÆ (Gray).

Shell irregularly obovate, solid, inequilateral; beaks not much elevated or inflated; posterior ridge high, sharply angled, ending in a point about on the median line; above it there seems to be a low, radial ridge; dorsal outline arched; anterior end narrowed, rounded; base subangularly produced behind the middle; epidermis thick, olive-colored; nacre variegated purple and red.

Length (of figure) 62.5, height 37 mm.

Rivers of Paraguay.

Anodonta georginæ GRAY, Griff. Cuvier., XII, 1834, pl. XIX.

Glabaris georginæ SIMPSON, Syn., 1900, p. 927.

A species, which seems to differ very decidedly from all others by having a sharp, high posterior ridge. No measurements, and only the briefest description are given, this consisting of a few words in the index.

Group of *Anodontites trigonus.*

Shell long, elliptical, solid, inflated, produced at posterior base, with a smooth, shining epidermis; nacre very bright.

ANODONTITES TRIGONUS (Spix).

Shell somewhat pentagonal, solid, subinflated, inequilateral; beaks moderately elevated; hinge line slightly arched; anterior end narrowed, rounded or subtruncate; posterior ridge well developed, rounded, ending in a blunt point about on the median line; dorsal slope obliquely truncate; base produced about at the middle where it is subangulate; epidermis pale to dark olive, somewhat sericeous, showing dark rest marks; nacre bluish, iridescent; muscle scars well marked.

Length 48, height 30, diam. 20 mm.

Brazil; Ecuador; Peru; Bolivia.

Anodon trigonus SPIX, Test. Fluv. Bras., 1827, p. 29, pl. XXII, fig. 2.

Margarita (Anodonta) trigona LEA, Syn., 1836, p. 51; 1838, p. 30.

Anodon trigona CATLOW and REEVE, Conch. Nom., 1845, p. 68.

Anodonta trigona HANLEY, Test. Moll., 1842, p. 218.—KUSTER, Conch. Cab. Ano., 1853, p. 9, pl. II, fig. 5.

Margaron (Anodonta) trigona LEA, Syn., 1852, p. 50; 1870, p. 75.

Glabaris trigonus SIMPSON, Syn., 1900, p. 928.

Anodon chiquetana d'ORBIGNY, Guer. Mag., 1835, p. 41.

Anodonta chiquetana PÆTEL, Conch. Sam., III, 1890, p. 177.

Anodonta castelnaudi HUPÉ, Moll. Nouv., III, 1857, p. 88, pl. XVIII, fig. 4.

Anodonta subrostrata PHILIPPI, Mal. Bl., XVI, 1869, p. 39.—PFEIFFER, Nov. Conch., III, 1869, p. 486, pl. CV, figs. 1-3.

Anodonta ucayalensis PHILIPPI, Mal. Bl., XVI, 1869, p. 40.—PFEIFFER, Nov. Conch., III, 1869, p. 486, pl. CV, figs. 4-6.

There is a shell in the Lea Collection bearing the name *Anodonta trigona* Spix, that is a little higher in proportion to length, and lighter colored than the figure of *A. trigonus* given by Spix, but it agrees well in other characters. It may possibly be entitled to specific rank. It may be given the varietal name of *pallescens*.

ANODONTITES AMAZONENSIS (Lea).

Shell elongated, subinflated, solid, inequilateral, subrhomboid; beaks moderately full and elevated, elongated; posterior ridge rounded, but having about three radial, thread-like ribs; hinge line lightly arched; base straight or a little incurved medially; anterior end evenly rounded; posterior end with a long, oblique subtruncation above, somewhat biangulate below; surface strongly and irregularly, concentrically sculptured; epidermis very dark olive with shadings of green, lighter at the beaks; nacre brilliant purple-rose; muscle scars impressed.

Length 81, height 37, diam. 25 mm.

Amazon.

Anodonta amazonensis LEA, Pr. Ac. N. Sci. Phila., IV, 1860, p. 89; Jl. Ac. N. Sci. Phila., V, 1863, p. 395, pl. XLVI, fig. 300; Obs., X, 1863, p. 31, pl. XLVI, fig. 300.—CLESSIN, Conch. Cab. Ano., 1874, p. 119, pl. XXXVII, fig. 7.

Anodon amazonensis SOWERBY, Conch. Icon., XVII, 1870, pl. XXX, fig. 120.

Margaron (Anodonta) amazonensis LEA, Syn., 1870, p. 82.

Glabaris amazonensis SIMPSON, Syn., 1900, p. 928.

Lea states that several specimens of *Anodonta amazonensis* were submitted to him by Mr. Wheatley. There is only the type, a slightly broken shell, in the Lea Collection. The group to which it belongs is a very puzzling one, and although I have had the opportunity to examine a good deal of material belonging to it, but little of it at all closely agrees with the figures or descriptions. There seems to be an almost complete connection between *amazonensis* and *mortonianus*, though the former is typically very much more elongated than the latter.

ANODONTITES WEDDELLII (Hupé).

Shell rather solid, subinflated, somewhat elongated, elliptic-rhomboid, inequilateral; beaks full and high; dorsal and basal lines curved; anterior end a little narrowed, rounded; posterior end obliquely truncate above, meeting the dorsal line with an angle, rounded below; surface with rather strong growth lines; epidermis dark brown; nacre white in the cavities, iridescent or green at the borders.

Length 66, height 35, diam. 22 mm.

Brazil.

Anodonta weddellii HUPÉ, Moll. Nouv., III, 1857, p. 87, pl. XVII, fig. 5.—CLESSIN, Conch. Cab. Ano., 1876, p. 214, pl. LXVI, fig. 1.

Anodon weddellii SOWERBY, Conch. Icon., XVII, 1868, pl. XX, fig. 80.

Margaron (Anodonta) weddellii LEA, Syn., 1870, p. 79.

Glabaris weddellii SIMPSON, Syn., 1900, p. 928.

Shorter in proportion to height, and not so cylindrical as *A. amazonensis*.

ANODONTITES ELONGATUS (Swainson).

Shell much elongated, solid, subinflated, inequilateral, subrhomboid when adult, long ovate when young; beaks rather full and high; hinge line lightly arched, the curve extending almost evenly to the post-basal point of the shell; anterior end evenly rounded; base nearly straight, in old shells sometimes a little incurved; surface with delicate growth lines, sometimes with very faint indications of radial sculpture; epidermis rich reddish-brown, shining; nacre brilliant, flesh-colored or pale rose, richly iridescent; anterior scars impressed; posterior scars large, distinct.

Length 74, height 36, diam. 25 mm.

Brazil.

Anodon elongatus SWAINSON, Zool. Ill., 1st Ser., III, 1823, pl. CLXXVI.

Margarita (Anodonta) elongata LEA, Syn., 1836, p. 53; 1838, p. 32.

Anodonta elongata HANLEY, Test. Moll., 1842, p. 223.

Anodon elongata CATLOW and REEVE, Conch. Nom., 1845, p. 66.

Glabaris elongatus SIMPSON, Syn., 1900, p. 928.

Anodonta solidula DEVILLE and HUPÉ, Rev. et Mag. Zool., 1850, p. 644, pl. XVI, fig. 2.—HUPÉ, Moll. Nouv., III, 1857, p. 88, pl. XVIII, fig. 2.—CLESSIN, Conch. Cab. Ano., 1876, p. 221, pl. LXXIII, fig. 2.

Margaron (Anodonta) solidula LEA, Syn., 1852, p. 53; 1870, p. 83.

Anodon solidula SOWERBY, Conch. Icon., XVII, 1869, pl. XXIII, fig. 91.

Anodonta wheatleyi LEA, Tr. Am. Phil. Soc., X, 1852, p. 287, pl. XXVI, fig. 49; Obs., V, 1852, p. 43, pl. XXVI, fig. 49.—CLESSIN, Conch. Cab. Ano., 1874, p. 113, pl. XXXVI, figs. 3, 4.

Margaron (Anodonta) wheatleyi LEA, Syn., 1852, p. 51; 1870, p. 82.

Anodon amethystus SOWERBY, Conch. Icon., XVII, 1869, pl. XXIV, figs. 95, 95*a*, 95*b*.

Anodonta amethysta CLESSIN, Conch. Cab. Ano., 1875, p. 180, pl. LX, fig. 3.

Anodon dactylus SOWERBY, Conch. Icon., XVII, 1867, pl. XIX, fig. 75.

Anodonta dactylus CLESSIN, Conch. Cab., 1875, p. 175, pl. LVII, fig. 3.

Margaron (Anodonta) dactylus LEA, Syn., 1870, p. 80.

Lea's *Anodonta wheatleyi* absolutely agrees with the figure of *A. elongatus* in Swainson's Zoological Illustrations. Viewed from above the shell is decidedly wedge-shaped behind the umbonal region. It is a beautiful species.

ANODONTITES LINGULATUS (Hupé).

Shell long elliptical, very solid, inequilateral, convex or subinflated; beaks moderately full and elevated; posterior ridge well developed, subangulate, arched; dorsal and basal lines rounded; anterior end narrowed, evenly rounded; posterior end with a short, oblique truncation above the decided point at the end of the posterior ridge; surface with strong, concentric striæ; epidermis greenish with brown bands or brownish-black; nacre white, iridescent at the border.

Length 97, height 50.5 mm.

Paraguay.

Anodonta lingulata Hupé, Moll. Nouv., III, 1857, p. 89, pl. xviii, fig. 1.—Clessin, Conch. Cab. Ano., 1875, p. 215, pl. lxvi, fig. 3.

Anodon lingulata Sowerby, Conch. Icon., XVII, 1869, pl. xxiii, fig. 90.

Margaron (Anodonta) lingulata Lea, Syn., 1870, p. 79.

Glabaris lingulata von Ihering, Arch. für Nat., 1893, p. 119.

Glabaris lingulatus Simpson, Syn., 1900, p. 929.

A fine, solid, almost regularly elliptical species. Hupe has evidently given erroneous measurements, for he says "Long., 100; haut., 92; épaiss., 40 mill."

The shell seems to be more ponderous and more evenly elliptical than any of the related forms.

Anodontites mortonianus (Lea).

Shell long rhomboid or subelliptical, rather solid, inequilateral, subinflated; beaks slightly prominent; posterior ridge somewhat double, sometimes with two or three slight, radial ridges and depressions; dorsal and basal outlines more or less curved, the latter full behind the middle; anterior end rounded, occasionally subangulate above; dorsal slope obliquely truncate; surface rather finely, concentrically sculptured; epidermis olive-brown to blackish; nacre whitish or flesh-colored, iridescent.

Length 77, height 41.5, diam. 30 mm.

Length 79, height 41.5, diam. 26 mm.

Length 79, height 39.5, diam. 26.5 mm.

Parana River. South America.

Anodonta mortoniana Lea, Tr. Am. Phil. Soc., V, 1834, p. 80, pl. xiii, fig. 37; Obs., I, 1834, p. 192, pl. xiii, fig. 37.—Clessin, Conch. Cab. Ano., 1874, p. 151, pl. xlviii, figs. 5, 6.

Margarita (Anodonta) mortoniana Lea, Syn., 1838, p. 30.

Anodon mortoniana Catlow and Reeve, Conch. Nom., 1845, p. 67.

Margaron (Anodonta) mortoniana Lea, Syn., 1852, p. 150; 1870, p. 80.

Glabaris mortonianus Simpson, Syn., 1900, p. 929.

The type of this, according to Dr. Lea, is in the Academy of Natural Sciences at Philadelphia. Several specimens are before me, which probably belong with this species, some of them of the Lea Collection and labeled *Anodonta mortoniana* by Lea himself. They show more or less transition towards *A. amazonensis.*

ANODONTITES LONGINUS (Spix).

"Shell transverse, oblong, almost three times as long as high, anterior end rounded and narrow; posterior end dilated, very obliquely truncated; solid, but not heavy; pellucid; posterior region obliquely angulated, transversely sulcate. Dorsal margin very long, compressed, elevated, and angulated posteriorly, obtusely angulate anteriorly; beaks somewhat prominent, depressed. Margins acute. Hinge terminating in a small sinulus. Epidermis brownish-green. Interior of shell smooth, pearly, bluish.

Length 4.7, height 1.7 in." (Spix).

Type locality, Japura and Solimoes rivers, Brazil.

Anodon longinus SPIX, Test. Fluv. Bras., 1827, p. 29, pl. XXII, fig. 1.

Mycetopus longinus CLESSIN, Conch. Cab. Ano., 1875, p. 202.

Glabaris longinus SIMPSON, Syn., 1900, p. 929.

Iridina longina LEA, Syn., 1836, p. 57.

Anodonta longina KUSTER, Conch. Cab. Ano., 1853, p. 7, pl. II, fig. 1.

Mycetopoda longina VON IHERING, Abh. Senckenb. Ges., XXXII, 1910, p. 119.

ANODONTITES HIDALGOI (Germain).

"Shell of medium size, elongate-subquadrangular, somewhat inflated, slightly gaping at both ends, terminating posteriorly in a short beak, situated very low; dorsal margin nearly straight, ascending, quite rapidly inflected from the postero-dorsal angle to the beak in a slightly curved line; ventral margin scarcely subconvex, very slightly incurved, almost parallel to the dorsal margin; anterior region short, rounded, cut away at the base; posterior region two and one-half times as long as the anterior, very slightly narrowed, subtruncate; beaks eroded, showing a lead-colored, very iridescent nacre, rounded, slightly compressed and quite prominent; dorsal ridge narrow towards the beaks, becoming obsolete towards the posterior region; ligament brilliant deep chestnut-color, quite strong, 14 mm. long; hinge very slightly curved, scarcely thickened; anterior muscular impressions subelliptical, quite deep; posterior very faint; pallial almost none. Shell thick, solid, comparatively heavy, with quite fine, concentric striæ; epidermis a brilliant chestnut-brown, becoming rusty posteriorly; nacre greenish-blue, very iridescent.

Length 44-45, height 27-26, at the beaks 16-15, diam. 17.25-17 mm." (Germain).

Type locality, Ecuador.

Anodonta (Glabaris) hidalgoi GERMAIN, Bull. Mus. Hist. Nat., 1908, p. 64.

ANODONTITES DULCIS (von Ihering).

"Shell elongate, oval, of medium size, gaping considerably at both ends, not very thin, quite inflated, with a shining surface. Anterior end rounded, narrower than the posterior end, which is broader and regularly rounded with the inconspicuous point above the middle. Beaks quite inflated, broad, approximate, and much eroded. The vertical profile is elongate heart-shaped. The horizontal profile shows the greatest diameter at about the middle of the length, from which point it evenly diminishes towards the posterior end, whereas anteriorly it very slowly decreases as far as the beaks, beyond which it rapidly slopes to the anterior region. The rounded anterior margin forms a distinct angle with the dorsal margin and curves regularly into the evenly rounded ventral margin. The dorsal margin is straight in front, slightly curved behind and passes gradually into the posterior margin. The dorsal area is broad, low, slightly abrupt; the lunule is linear and very small. The ligament is long, ending in a triangular sinulus, the anterior edge of which is the shorter and almost vertical or slightly oblique. Epidermis olive-green, lighter on the posterior portion and dark brown anteriorly. Nacre iridescent blue. The prismatic margin is narrow. Impressions of the posterior adductors are under and partly behind the sinulus; those of the anterior adductors are very small. The sculpture is peculiar. On the anterior portion are numerous radiating striæ, while the epidermis, where it remains, shows fine, radial wrinkles, which are very short on account of being interrupted by the lines of growth.

I have before me two single valves of almost the same length. The length of the hinge is 48 mm. The beaks are 19 mm. from the end of the hinge, showing an umbonal index of 39.60/100.

Length 79, height 45, diam. 29 mm." (von Ihering).

Type locality, Fazenda do Sacremento, Municipio de San Domingos do Prata in the State Minas, and undoubtedly in the region of the Rio Doce.

Glabaris dulcis VON IHERING, Abh. Senckenb. Ges., XXXII, 1910, p. 132, pl. 12, figs. 5*a-b*.

Section STYGANODON von Martens, 1900.

Styganodon VON MARTENS, Biol. Cent. Am., Moll., 1900, p. 525.

Shell subrhomboid, with a thick, dark, rather rough, sombre-colored epidermis, which is sometimes faintly rayed, nacre lurid, shaded green; animal unknown.

Type, *Anodonta tenebricosa* Lea.

Group of *Anodontites tenebricosus*.

Shell elongate, slightly inflated; base incurved.

ANODONTITES TENEBRICOSUS (Lea).

Shell long rhomboid or trapezoid, somewhat inflated, rather solid, especially when old, inequilateral; beaks but slightly elevated; anterior end narrowed, rounded, generally more or less cut away below; hinge line slightly arched; base straight or a little incurved medially; posterior end somewhat obliquely truncate or subtruncate above, rounded below; posterior ridge full, rounded; surface rough, usually with rude, irregular growth lines, covered with a thick, dirty olive or brown epidermis, which sometimes is feebly rayed; nacre lurid, bluish or greenish, thicker in front; muscle scars large, impressed; prismatic border wide.

Length 83, height 46, diam. 37 mm.

Length 80, height 48, diam. 30 mm.

Brazil, Ecuador, Peru; south to Argentina.

Anodonta tenebricosa LEA, Tr. Am. Phil. Soc., V, 1834, p. 78, pl. XII, fig. 36; Obs., I, 1834, p. 190, pl. XII, fig. 36.—CHENU, Man., 1859, p. 146, p. 720.

Margarita (Anodonta) tenebricosa LEA, Syn., 1836, p. 54; 1838, p. 32.

Anodon tenebricosa SOWERBY, Conch. Icon., XVII, 1867, pl. XIII, fig. 43.

Margaron (Anodonta) tenebricosa LEA, Syn., 1852, p. 53; 1870, p. 83.

Glabaris tenebricosa VON IHERING, Arch. für Nat., 1893, p. 61.

Anodon tenebricosus SOWERBY, Conch. Icon., XVII, 1870, pl. XXXI, fig. 123.

Glabaris tenebricosus SIMPSON, Syn., 1900, p. 930.

A rough, dull-colored, unattractive species, which, when old, usually has the shell much eroded. The border outside the pallial line is wide, and in old specimens the pallial line is generally impressed and crenate.

ANODONTITES PASTASANUS (Clessin).

Shell rather short, rhomboid, moderately inflated, subsolid, subrugose, lightly, undulately striate, somewhat inequilateral; beaks full and elevated; hinge line arched; base incurved medially so that the shell is a little arcuate; anterior end rounded; posterior end obliquely truncate above, rounded below; epidermis dark fuscous; nacre whitish.

Length 69, height 37, diam. 26 mm.

Rio Pastasa, Ecuador.

Anodonta pastasana CLESSIN, Mal. Bl. (2), I, 1879, p. 173, pl. XI, fig. 1.

Glabaris pastasanus SIMPSON, Syn., 1900, p. 930.

A comparatively short, somewhat inflated species which has a decidedly rhomboid outline. It is rather shorter in proportion to its height than *A. tenebricosus* and is more rhomboid and arcuate.

ANODONTITES SOLENIFORMIS (d'Orbigny).

Shell elongated, falcate-rhomboid, subcompressed, scarcely subsolid, inequilateral; beaks low, subcompressed; posterior ridge full, widely rounded; dorsal outline lightly arched; base incurved medially; anterior end a little narrowed, rounded; posterior end obliquely truncate above, rounded below; epidermis dull, lurid, greenish-brown, sublamellous, often faintly rayed behind; nacre very dark, lurid, with bluish, greenish and brownish tints, iridescent; prismatic border wide.

Length 75, height 28, diam. 15 mm.

Brazil, south into Argentina.

Anodonta soleniformis d'ORBIGNY, Guer. Mag., 1835, p. 41; Voy. Am. Mer., 1843, p. 617, pl. LXXIV, figs. 1, 3.—CLESSIN, Conch. Cab. Ano., 1873, p. 111, pl. XXVII, fig. 1.

Margarita (Anodonta) soleniformis LEA, Syn., 1838, p. 32.

Margaron (Anodonta) soleniformis LEA, Syn., 1852, p. 53; 1870, p. 83.

Glabaris soleniformis VON IHERING, Arch. für Nat., 1893, p. 59. —SIMPSON, Syn., 1900, p. 930.

Anodon solenidea SOWERBY, Conch. Icon., XVII, 1867, pl. XVIII, fig. 65.

Margaron (Anodonta) solenidea LEA, Syn., 1870, p. 83.

Several specimens of this species, donated to Dr. Lea by d'Orbigny are before me. They are a little narrower in front than behind, and falcate, being much more elongated and compressed than *A. tenebricosus*.

ANODONTITES CLESSINI (Fischer).

Shell somewhat elongate, subinflated, arcuate-rhomboid, subsolid, inequilateral; beaks moderately full; dorsal line lightly arched; base incurved medially; anterior end rounded or lightly cut away below; posterior end obliquely rounded or sometimes obliquely subtruncate; anterior base gaping; epidermis concentrically lamellose, showing slight, radial foldings, rough and dull, greenish-brown; nacre lurid, greenish or bluish-green, sometimes very dark.

Length 80, height 32, diam. 19 mm.

Length 57, height 27, diam. 17 mm.

Southern Brazil; southward into Argentina.

Mycetopus plicatus CLESSIN, Mal. Bl., V, 1882, p. 190, pl. IV, fig. 7.

Mycetopus clessini FISCHER, Jl. de Conch., XXXVIII, 1890, p. 8, footnote.

Glabaris nehringi VON IHERING, Arch. für Nat., 1893, p. 60.

Glabaris clessini SIMPSON, Syn., 1900, p. 930.

This species varies considerably in form, the posterior end being either obliquely rounded or almost squarely subtruncate. It is more elongated in proportion to its height than *tenebricosus* or *pastasanus*.

Fischer changed the name *plicatus* to *clessini* because the former name had been used by Sowerby for a species which he (Sowerby) placed in *Mycetopus*. Sowerby's shell is a *Mutela*, and that of Clessin a *Anodontites* of the *tenebricosus* group. Von Ihering applied the name *nehringi* to the above after Fischer had changed it, and was evidently not aware that the French savant had done so.

ANODONTITES BAMBOUSEARUM (Morelet).

Shell somewhat elongated, subrhomboid, slightly falcate, subinflated, rather solid, inequilateral, with a chestnut-brown epidermis, which is brilliant at the anterior part and sublamellose at the posterior end, having a few black rays; beaks low; dorsal line lightly arched; anterior end rounded, a little narrowed; base very slightly incurved medially; posterior end slopingly rounded above, more narrowly rounded below; nacre bluish-white; muscle scars shallow.

Length 75, height 40, diam. 24 mm.

Palenque in Chiapas, Mexico.

Anodon bambouscarum MORELET, Test. Nov., II, 1851, p. 24.

Anodonta bambousearum FISCHER and CROSSE, Miss. Sci., II, 1894, p. 527, pl. LXIII, figs. 6, *6a*.

Glabaris bambousearum SIMPSON, Syn., 1900, p. 930.

I have never seen this species, but Fischer and Crosse give a full description and beautiful figures of it in the Mission Scientifique. It is shorter in proportion to its height than *A. soleniformis* and differs from the other allied species in having the anterior end shining.

ANODONTITES SCHRÖTERIANUS (Lea).

Shell elongated, subtrapezoid, convex, moderately solid, inequilateral; beaks elevated and sharp but not full; hinge line curved, the curve continuing along the posterior end to near the base; anterior end considerably narrowed; base lightly curved or straight; epidermis dull, thick ,dark greenish-brown, feebly rayed on the dorsal slope, sublamellous and subreticulated; nacre bluish, slightly lurid, sometimes marked with letter-like or zigzag characters; pallial line with a small posterior sinus.

Length 76, height 38, diam. 20 mm.

Amazon drainage.

Anodonta schröteriana LEA, Tr. Am. Phil. Soc., XI, 1852, p. 292, pl. XXIX, fig. 55; Obs., V, 1852, p. 48, pl. XXIX, fig. 55. —HUPÉ, Moll. Nouv., III, 1857, p. 89, pl. XVIII, fig. 3.—CLESSIN, Conch. Cab. Ano., 1874, p. 151, pl. XLVII, figs. 5, 6.

Margaron (Anodonta) schröteriana LEA, Syn., 1852, p. 51; 1870, p. 82.

Anodon schröteriana SOWERBY, Conch. Icon., XVII, 1868, pl. XX, fig. 74.

Margaritana schröteriana PÆTEL, Conch. Sam., III, 1890, p. 173.

Glabaris schröterianus SIMPSON, Syn., 1900, p. 931.

The figured type is not in the Lea Collection, but two well matched valves very closely approaching it are. The outline is trapezoid, the shell being considerably narrowed in front. It is not so inflated as *A. bambousearum*, is narrower in front, and the anterior part of the epidermis is not smooth.

Group of *Anodontites obtusus.*

Shell short, inflated, thin, feebly rayed, rays often broken; base rather full.

ANODONTITES OBTUSUS (Spix).

Shell rather short, somewhat obovate, scarcely inflated, thin to subsolid, inequilateral; beaks moderately elevated; dorsal outline arched; anterior end narrowed, rounded; base nearly straight; posterior end widely rounded or almost squarely subtruncate; epidermis somewhat concentrically plicate, sometimes with inconspicuous, radial plications, greenish-olive, lurid, often with feeble, wavy or broken rays, especially on the dorsal slope; nacre bluish and greenish-tinted, lurid; muscle scars shallow.

Length 60, height 40, diam. 25 mm.

Brazil; Paraguay.

Anodon obtusus SPIX, Test. Fluv. Bras., 1827, p. 30, pl. XXII, fig. 3.

Margarita (Anodonta) obtusa LEA, Syn., 1836, p. 52; 1838, p. 31.

Anodonta obtusa POTIEZ and MICHAUD, Gall. Moll., 1844, p. 144, pl. LV, fig. 3.—KUSTER, Conch. Cab. Ano., 1853, p. 8, pl. II, figs. 3, 4.—MUSGRAVE, Phot. Conch., 1863, pl. I, fig. 7. —CLESSIN, Conch. Cab. Ano., 1875, p. 170, pl. LVI, figs. 1, 2.

Margaron (Anodonta) obtusa LEA, Syn., 1852, p. 51; 1870, p. 82.

Anodon obtusa SOWERBY, Conch. Icon., XVII, 1867, pl. XII, fig. 39.

Glabaris obtusus SIMPSON, Syn., 1900, p. 931.

Anodonta VALENCIENNES, Coq. Mar. Biv., 1827?, pl. XLVIII, figs. 3*a*, *b*.

A short, rather thin, subinflated, obovate species.

Var. *juparanus* (von Ihering).

"The specimens described come from the Lagoa Juparana. They differ from the typical form only in the hind end, the rounded, low extremity of which is separated from the oblique posterior margin by a shallow excavation. Three diverging ridges extend from the beaks to the hinder end, the upper of which forms the projecting angle, which I have mentioned. The largest specimen has a length of 52 and a height of 36 mm. But I have already received this variety from Mucury, represented by considerably larger and thicker specimens, of which the largest has a length of 60 mm." (von Ihering).

Glabaris obtusa juparana VON IHERING, Abh. Senckenb. Ges., XXXII, 1910, p. 131.

ANODONTITES LITURATUS (Spix).

Shell rather small, obovate, somewhat inflated, subsolid, inequilateral; beaks full and high; dorsal and basal outlines slightly curved; anterior end narrowed and rounded; posterior end almost evenly rounded, slightly fuller below; surface of the shell greenish, with numerous radial spots or broken rays of darker color; nacre iridescent, purplish-tinted.

Length 42, height 28 mm.

Brazil.

Anodon obtusus var. *b. lituratum* SPIX, Test. Fluv. Bras., 1827, p. 30, pl. XXII, fig. 4.

Anodonta litturata HUPÉ, Moll. Nouv., 1857, p. 87, pl. XVII, fig. 4.

Anodon liturata SOWERBY, Conch. Icon., XVII, 1868, pl. XX, fig. 78.

Glabaris lituratus SIMPSON, Syn., 1900, p. 931.

Probably a valid species, though Dr. Lea believed it to be the same as *A. obtusus*. It seems to be a smaller species, is more inflated and solider than *obtusus*. The epidermis differs in being green, and having, for the most part, broken rays. According to Hupe's figure the nacre is purplish.

Section VIRGULA Simpson, 1900.

Virgula SIMPSON, Syn., 1900, p. 931.

Shell subsolid to solid, moderately inflated, greatly elongated, straight or falcate, rounded in front, sharply pointed at the posterior base, where the high, sharply defined posterior ridge ends and above which it is somewhat obliquely truncated; beaks not high; epidermis green to olive; nacre brilliant, bluish or purplish, iridescent, rayed with very fine, indistinct ridges; posterior end with a slight sinus.

Type, *Anodon ensiformis* Spix.

ANODONTITES ENSIFORMIS (Spix).

Shell very greatly elongated, subsolid, convex, inequilateral, wider in front, drawn out to a slender point behind, more or less arcuate when adult; beaks but little elevated; posterior ridge well developed, sometimes pinched up into a rather narrow, rounded ridge, ending at the base of the shell in a decided point; anterior end evenly rounded; hinge line lightly arched, joining the long oblique dorsal slope at a low angle; surface with strong, irregular growth lines and inconspicuous, radial threads; epidermis dark, greenish-brown, scarcely shining; nacre brilliant, bluish, bordered and tinted with green, richly iridescent; anterior scars well marked; posterior scars shallow.

Length 106, height 27, diam. 15 mm.

Length 97, height 25, diam. 15 mm.

Tropical South America.

Anodon ensiformis SPIX, Test. Fluv. Bras., 1827, p. 31, pl. XXIV, figs. 1, 2.—SOWERBY, Conch. Icon., XVII, 1867, pl. XI, fig. 31.

Iridina ensiformis LEA, Syn., 1836, p. 57.

Anodonta ensiformis d'ORBIGNY, Voy. Am. Mer., 1843, p. 618, pl. LXXIX, fig. 10.—KUSTER, Conch. Cab. Ano., 1853, p. 8, pl. II, fig. 12.—?CHENU, Man., 1859, II, p. 146, fig. 721.

Margarita (Anodonta) ensiformis LEA, Syn., 1838, p. 32.

Margaron (Anodonta) ensiformis LEA, Syn., 1852, p. 51; 1870, p. 82.

Glabaris ensiformis SIMPSON, Syn., 1900, p. 932.

An excessively elongated and peculiar species, with dazzlingly brilliant, iridescent nacre.

ANODONTITES FALSUS (Simpson).

Shell much elongated, scarcely falcate, somewhat rhomboid, scarcely subsolid, subcompressed, very inequilateral; beaks low and not inflated; posterior ridge well developed, rounded, ending in a blunt point at the base of the shell; dorsal and basal lines parallel; anterior end rounded; posterior end obliquely rounded; epidermis somewhat concentrically wrinkled, smoother on the dorsal slope, with faint, radial markings in front, dull ashy-brownish or greenish-brown, with inconspicuous rays on the dorsal slope; nacre bluish, dull purplish in the cavities, iridescent.

Length 77, height 21.5, diam. 11 mm.

Yuruari River, a branch of the Orinoco.

Glabaris falsus SIMPSON, Syn., 1900, p. 932.

This species stands between *A. ensiformis* and *A. soleniformis*, though I should think it considerably nearer to the former. It differs from that in having the dorsal and ventral outlines parallel, in having the posterior end obliquely rounded from above instead of being drawn out to a slender point, in being duller colored exteriorly and internally. *A. ensiformis* sometimes shows very feeble rays behind.

The following are unfigured or unidentified species of *Anodontites*:

Anodon porcifer GRAY, Pr. Zool. Soc. Lond., 1834, p. 58.
Paraguay.

Anodonta nicaragua PHILIPPI, Zeits. für Mal., V, 1848, p. 130.
—VON MARTENS, Biol. Cent. Am., Moll., 1900, p. 536.
Nicaragua.

Von Martens, (l. c.), believes this to be the same as *A. bridgesii* Lea, in which case it would have priority.

Anodonta aperta RAFINESQUE, Atl. Jl. No. 4, 1832, p. 134.
Parana River, South America.

Anodonta atrovirens PHILIPPI, Zeits. für Mal., V, 1848, p. 130.
—VON MARTENS, Biol. Cent. Am., Moll., 1900, p. 534.—SIMPSON, Syn., 1900, p. 933.

Von Martens, (l. c.), considers this to be the same as *A. inæquevalvis* Lea. If correct, it would have priority.

Anodonta carinata DUNKER, Mal. Bl., V, 1858, p. 225.
Colombia.

Anodonta cornea PHILIPPI, Zeits. für Mal., V, 1848, p. 130.—VON MARTENS, Biol. Cent. Amer., Moll., 1900, p. 535.
Nicaragua.

Von Martens, (l. c.), states that this species resembles *A. inæquivalvis* Lea, but, on account of certain discrepancies, he "dare not identify it with Lea's species."

Anodonta giullaini H. and A. ADAMS, Gen. Rec. Moll., II, 1857, p. 502. Credited to Recluz.

Anodonta paphos RAFINESQUE, Atl. Jl. and Friend., 1832, p. 134.
Parana River.

Anodon pictus SWAINSON, Ex. Conch., 2d ed., 1841, p. 139.

Anodonta wallisi MOUSSON, Mal. Bl., XVI, 1869, p. 188.

Anodonta bergi VON IHERING.
Where?

Genus MYCETOPODA d'Orbigny, 1835.

Mycetopoda d'ORBIGNY, Guer. Mag., 1835, p. 41.

Mycetopus d'ORBIGNY, Voy. Am. Mer., 1847, p. 600.

Shell thin, elongated, truncate above behind, with a low, posterior ridge and rather flat, smooth or slightly concentrically wrinkled beaks; epidermis smooth, shining, pale greenish-yellow or brownish, rayless; hinge line long, straight, edentulous or showing faint traces of denticles under a glass beneath the nacre; nacre soft, bluish-white and iridescent; muscular impressions faint, irregular, the smaller anterior scar above the larger one; beak cavities shallow.

Animal having very long gills, the inner much the larger, united to the abdominal sac throughout their whole length; palpi large, round below, projecting very slightly behind, and attached along the whole length of the straight upper border; mantle very thin, slightly thickened at the edges; branchial opening closed below into a short, papillose siphon, and separated from the nearly smooth anal opening by a strong bridge; superanal opening not closed below; foot very long, developed at the lower end into a sort of head or button.

Type, *Mycetopoda soleniformis* d'Orbigny.

So named by its author in the Guerin Magazine, but afterwards changed by him to *Mycetopus* in the Voyage Amerique Meridionale. The genus has been made the type of a separate family by Gray, and was so acknowledged by Gill, Pelseneer and others, but it does not seem to me to be separable from the *Mutelidæ*.

The genus *Mycetopoda* is a well-characterized group containing a few South American forms, all of which have elongated, delicate shells and a foot capable of great extension and are, no doubt, without exception, burrowers. Although the shells of *Solenaia* closely resemble those of this group and the species of that genus undoubtedly burrow, I have every reason to doubt that there is any close relationship between them. The shells of *Solenaia* are of different texture and they show a ruder growth than do those of *Mycetopoda*. Such vestigial teeth as the former have are distinctly schizodont, while those of *Mycetopoda*, when at all developed, are taxodont.

I do not feel at all sure that the different so-called species *siliquosa, occidentalis, staudingeri, subsinuata, pygmæa* and *hupeana* are anything more than variations of one widespread, abundant and variable form. I have material before me, which differs somewhat from any of the above, but I do not feel justified in bestowing on it either specific or varietal names.

Group of *Mycetopoda siliquosa*.

Beaks in front of the center of the shell; anterior end evenly rounded; basal lines nearly straight; posterior ridge quite low. Animal with the characters of the genus.

MYCETOPODA SILIQUOSA (Spix).

Shell somewhat elongated, thin, inequilateral, scarcely inflated, gaping at the anterior base, subtrapezoid; beaks but moderately full; posterior ridge well-developed, usually rather narrowly rounded, ending in a blunt point at the base of the shell; hinge line straight; base line straight or slightly inflated medially; anterior end narrowed and rounded; posterior end decidedly obliquely truncate; surface with irregular growth lines, often with inconspicuous radial sculpture; epidermis ashy-green, often flushed with brown, shining; nacre bluish-white.

Length 100, height 37, diam. 18.5 mm.

Length 115, height 39, diam. 20 mm.

Bolivia, Brazil; south into Argentina.

Anodon siliquosus SPIX, Test. Fluv. Bras., 1827, p. 30, pl. XXIII, fig. 2.

Mycetopus siliquosus H. and A. ADAMS, Gen. Rec. Moll., II, 1857, p. 505; III, pl. CXVIII, fig. 1.—SOWERBY, Conch. Icon., XVI, 1868, pl. I, fig. 2; III, fig. *2a.*—CLESSIN, Conch. Cab. Ano., 1875, p. 200, pl. LXVIII, figs. 2-4; LXIX, fig. 1.

Platiris (Mycetopus) siliquosus LEA, Syn., 1852, p. 56; 1870, p. 90.

Platiris (Iridina) siliquosa LEA, Syn., 1836, p. 56; 1838, p. 34.

Anodonta siliquosa KUSTER, Conch. Cab. Ano., 1853, p. 35, pl. VIII, fig. 3.

Mycetopoda siliquosa CHENU, Ill. Conch., 1858, pl. I, figs. 2, *2a, 2b, 2c.*—SIMPSON, Syn., 1900, p. 934.

? Anodonta legumen VON MARTENS, S. B. Nat. Fr., 1888, p. 65.

Glabaris legumen SIMPSON, Syn., 1900, p. 932.

Mycetopoda legumen VON IHERING, Abh. Senckenb. Ges., XXXII, 1910, p. 120.

Mycetopus clessini VON IHERING, Arch. f. Naturg., 1893, p. 57.

Mycetopoda clessini VON IHERING, Abh. Senckenb. Ges., XXXII, 1910, p. 120.

This seems to be a variable form approaching closely in some cases to *M. occidentalis*, but is less inflated, more elongated, has a straight hinge line and is more obliquely truncate posteriorly. It is quite probable that it runs into *M. subsinuata.* The *clessini* of von Ihering is the same as Sowerby's figure of *siliquosa* on pl. III, fig. *2a.*

Var. *staudingeri* (von Ihering).

More decidedly obliquely truncate behind and more nearly straight on the base than typical *siliquosa*.

Upper Amazon in Ecuador and Peru.

Mycetopus staudingeri VON IHERING, Arch. für Naturg., 1890, p. 131, figs. A, B.

Mycetopoda staudingeri SIMPSON, Syn., 1900, p. 934.—VON IHERING, Abh. Senckenb. Ges., XXXII, 1910, p. 121.

Von Ihering, (l. c. 1910, p. 121), says in regard to this form: "The strong elevation of the dorsal margin, especially behind the sinulus, as well as the post-sinual posterior adductor scars, are characteristic of this species. It is restricted in its distribution to the region of the Upper Amazon, whence I have it from Huallaga and Huagamba. The specimen "B," which I figured, has a length of 103 and a diameter of 21 mm. The height in the middle of the shell is 36 and at the posterior angle of the dorsal margin 43 mm.

The variety from Ecuador, which I mentioned in my original description, (p. 130), is decidedly larger. It reaches a length of 142 mm., but the largest specimen that I have examined is apparently, judging from the muscular impressions, not fully grown. Moreover this Ecuador form has the anterior end lower and the posterior end much more elongate; I, therefore, distinguish it as var. *æquitorialis* var. n. It was cited by Clessin, Mal. Bl., N. F., I, 1879, p. 174, from Ecuador as *M. siliquosus* Orb. from specimens collected by Higgins."

MYCETOPODA ORBIGNYI von Ihering.

"Of this species, which d'Orbigny confused with *M. siliquosa*, I have examined a specimen from Bolivia received from d'Orbigny. I have scarcely anything to add to the description and figure of d'Orbigny, except that the position of the posterior muscular impressions is præsinual. This species differs from *M. siliquosa* in its considerable size and much longer posterior region. The latter does not really exceed 80 mm. in length and has the anterior end much smaller than this species. The adductor scar is decidedly præsinual. On the dorsal area are two or three broad, radiating ridges. The specimen from Piricacaba is only 73 mm. long and yet, according to the muscular impressions, fully grown. Compared with it, *M. orbignyi* reaches double the size, even to 140 mm. in length. According to d'Orbigny, this species lives both in Bolivia and the Rio de la Plata." (von Ihering).

Mycetopoda siliquosus d'ORBIGNY, Guer. Mag., 1835, p. 41.

Mycetopus siliquosus d'ORBIGNY, Voy. Am. Mer. Moll., 1843, p. 601, pl. LXVII.

Mycetopoda siliquosa, (part), SIMPSON, Syn., 1900, p. 934.

Mycetopoda orbignyi VON IHERING, Abh. Senckenb. Ges., XXXII, 1910, p. 121.

MYCETOPODA OCCIDENTALIS Clessin.

Shell somewhat elongate, subtrapezoid, subinflated, thin, shining, brownish-green; beaks rather full; dorsal line straight behind the beaks, incurved in front of them; anterior end narrowed, rounded, subangulate above; base line curved a little; posterior end wide, rounded, subangulate above and below; nacre bluish-white.

Length 96, height 44, diam. 23 mm.

Rio Patasa, Ecuador.

Mycetopoda occidentalis CLESSIN, Mal. I, Bl. 1, 1879, p. 174, pl. XI, figs. 2, 3.—SIMPSON, Syn., 1900, p. 934.

This species has a somewhat trapezoid shell and is unusually high in proportion to its length. The anterior end is considerably narrowed; the posterior end is wide, and though almost evenly rounded is bluntly angled above and below, a character not found in any other species that I know of.

MYCETOPODA SUBSINUATA (Sowerby).

Shell elongated, irregularly obovate, inflated, thin, gaping in front, inequilateral; beaks only moderately elevated; hinge line straight behind the beaks, slightly incurved in front of them; anterior end evenly rounded, narrowed; base full at and behind the middle, subsinuate anteriorly; posterior end slopingly rounded above, more narrowly rounded below; epidermis smooth, olive-colored.

Length 121, height 40 mm.

Bogota; Colombia; Ecuador.

Mycetopus subsinuatus SOWERBY, Conch. Icon., XVI, 1868, pl. IV, fig. 10.—CLESSIN, Conch. Cab. Ano., 1875, p. 205, pl. LXVII, fig. 3.—VON MARTENS, Biol. Cent. Am., Moll., 1901, p. 540, pl. XLI, fig. 5-5*a*.

Mycetopoda subsinuata SIMPSON, Syn., 1900, p. 934.

I have seen specimens of what I believe to be *M. siliquosa* that approach this somewhat, but none which equal it in the elongated inflation from in front of the middle of the base to near its hinder end.

MYCETOPODA PYGMÆA (Spix).

Shell much elongated, delicate, thin, convex, narrowed in front, wider behind, gaping at the anterior base; beaks low; dorsal line straight; base slightly fuller in the middle; anterior end rounded, narrowed; posterior end slopingly rounded above, narrowly rounded below; surface with faint growth lines; epidermis smooth and shining in front, roughened and reticulated on the dorsal slope, pale amber-color, sometimes tinted green; nacre bluish, very delicately, radially sculptured, iridescent.

Length 73, height 22, diam. 12 mm.

Brazil; northward to Nicaragua.

Anodon siliquosus var. *b, pygmæum* SPIX, Test. Fluv. Bras., 1827, p. 30, pl. XXIII, figs. 3, 4.

Mycetopus pygmæus SOWERBY, Conch. Icon., XVI, 1868, pl. II, fig. 4.—CLESSIN, Conch. Cab. Ano., 1875, p. 207, pl. LXX, fig. 3.

Platiris (Mycetopus) pygmæus LEA, Syn., 1870, p. 90.

Mycetopoda pygmæa SIMPSON, Syn., 1900, p. 934.

Mycetopus weddellii HUPÉ, Moll. Nouv., III, 1857, p. 93, pl. XX, fig. 2.—SOWERBY, Conch. Icon., XVI, 1868, pl. II, fig. 5. —CLESSIN, Conch. Cab. Ano., 1875, p. 203, pl. LXVI, fig. 6.

Mycetopoda weddelli von Ihering, Abh. Senckenb. Ges., XXXII, 1910, p. 119.

An exceedingly thin, delicate species, which sometimes has a form much like specimens of *M. siliquosa,* but it is always smaller and more fragile. The finely reticulate epidermis on the dorsal slope is a good distinguishing character. Von Ihering believes this to be the young of *M. siliquosa,* but it differs in the character of the epidermis, texture and form from young *siliquosa* that I have seen.

Von Ihering, (l. c.), considers *weddellii* specifically distinct from *pygmæa.*

Mycetopoda hupeana (Clessin).

Shell small, thin, subtrapezoid, somewhat inequilateral; greenish-tinted or olive-green; beaks full, moderately elevated; hinge line straight; anterior end narrowed, rounded, cut away below; base line nearly straight, a little fuller behind the middle; posterior end almost squarely subtruncate.

Length 54, height 21 mm.

Brazil.

Mycetopus pygmæus Hupé, Moll. Nouv., III, 1857, p. 93, pl. xix, fig. 2.

Mycetopus hupeanus Clessin, Conch. Cab. Ano., 1875, p. 206, pl. lxvi, fig. 15.

Mycetopoda hupeana Simpson, Syn., 1900, p. 935.—von Ihering, Abh. Senck. Ges., XXXII, 1910, p. 119.

This may be only a variety of *siliquosa,* but the beaks are more central than in any specimens of that species I have seen. It is higher in proportion to its length than *M. pygmæa,* and less inequilateral.

Von Ihering, (l. c.), refers Sowerby's figure of *M. pygmæa,* (pl. ii, fig. 4), to this species.

Mycetopoda bahia von Ihering.

"A fragile, transparent shell, which gapes comparatively little in front. The diameter increases rapidly from the anterior margin as far as the beaks, then gradually to the middle of the shell, whence it gradually slopes to the hinder end.

Dorsal margin straight; antero-dorsal angle sharp; postero-dorsal angle rounded. The ventral margin is convex, sloping to the last third of the shell, whence it gradually ascends. The anterior end is regularly rounded, with a low, rounded extremity. A broad fold, widening posteriorly, extends from the beaks to the hinder end. Beaks low, scarcely rising above the hinge, and situated at 23 mm. from the anterior end or at 30/100 of the length. The sinulus is shallow, bordered in front by a short, oblique line and gradually disappearing towards the end of the dorsal margin. The form of the sinulus militates against the theory that the specimen is a very young one, yet the slight depth of the muscular impressions would indicate that it is not fully grown. The shell is exceptionally thin, so much so that it is possible to read the underlying label through its substance. The posterior adductor scars are subsinual and even præsinual. Epidermis pale green, darker towards the ventral margin and with radiating rays on the anterior half. Nacre lively iridescent, with fine, radiating rays. The prismatic border is only 1 mm. in front, but at the hinder end becomes from 6 to 8 mm. wide.

Length 78, height in the middle 26, behind 27 mm., which is from 33/100 to 34/100 of the length, diam. 15.5 mm." (von Ihering).

Type locality, Rio Sao Francisco, Villa Nova, State of Bahia.

Mycetopoda bahia VON IHERING, Abh. Senck. Ges., XXXII, 1910, p. 122, pl. 12, figs. 3*a-b*.

"This species stands near to *M. hupeana,* but differs in having the portion of the dorsal margin behind the beaks much longer, which explains the longer form of the shell and the more anterior position of the beaks."

MYCETOPODA PUNCTATA (Preston).

"Shell elongate, thin, covered with a pale olive periostracum, and exteriorly sculptured with faint striæ radiating from the umboes; umboes inconspicuous; anterior end rounded, gaping; posterior end produced, acuminate below; dorsal margin straight; ventral margin slightly convex; interior of shell nacreous, marked throughout with very fine, radiating, punctate striæ.

Length 72, height 21.5 mm." (Preston).

Type locality, Rio Chenchi, U. S. Colombia.

Myctopus punctatus Preston, Ann. Mag. Nat. Hist., (8), III, 1909, p. 513, pl. x, fig. 8.

Mycetopoda punctata von Ihering, Abh. Senck. Ges., XXXII, 1910, p. 122.

Von Ihering, (l. c.), remarks: "This species stands very close to *M. krausei,* but differs from it by the more anteriorly situated and less inflated beaks, which do not rise above the dorsal margin, while in *krausei* the elevation is conspicuous. The punctate, radial striæ on the interior of the shell, which, according to Preston, characterize the species, are not visible in *M. krausei.*"

Mycetopoda krausei von Ihering.

"Shell thin, moderately large, quite elongate, gaping rather widely in the anterior half. The greatest diameter is about in the middle of the shell, from which it slopes gradually to the posterior margin, and anteriorly as far as the beaks, from which point it slopes more rapidly to the anterior margin. The beaks are flat, small, slightly prominent and are situated at 21 mm. from the anterior end, being 1-4 of the length. Anterior end regularly rounded; the hinder end tongue-shaped, pointed, with the point below the middle of the shell. The dorsal margin is straight and meets the anterior margin at a sharp angle; the ventral margin is curved, oblique in front and extending posteriorly to the height of the sinulus, whence it gradually ascends to the hinder end. An obtuse, broad ridge extends from the beaks towards the hinder end. Above this two or three shallow furrows extend posteriorly. Epidermis bright olive-green, becoming brownish towards the ventral margin, with feeble, radiating rays. Muscular impressions weak, the posterior adductor scars extend anteriorly to the middle of the sinulus or even a little further. The sinulus is small, not deep and triangular. The prismatic border is narrow and broadens out only towards the hinder end, where it becomes 3 mm. wide. Nacre blue and red, iridescent, except under the hinge where it is a yellowish-brown.

Length 85, height 25 mm. or 29/100 of the length." (von Ihering).

Type locality, Rio Araguaya, Ilha do Bananal.

Mycetopoda krausei von Ihering, Abh. Senck. Ges., XXXII, 1910, p. 121, pl. 12, fig. *2a-b*.

Group of *Mycetopoda ventricosa*.

Shell rather short and high, subrhomboid with a strong angle at the anterior upper point, cut away below in front, slightly sinuous on the base, narrower behind; strongly truncate on posterior slope; posterior ridge wide and lightly curved; hinge line curved.

Mycetopoda ventricosa d'Orbigny.

Shell somewhat elongated, rhomboid, thin, subinflated, yellowish-brown, very inequilateral; beaks somewhat elevated; dorsal and ventral lines nearly straight and parallel, the latter slightly incurved; anterior end angled above, rounded and cut away below; posterior end obliquely truncate above, bluntly pointed below the median line, rounded below; nacre flesh-colored.

Length 112, height 42, diam. 21 mm.

Bolivia.

Mycetopoda ventricosa d'Orbigny, Voy. Am. Mer., 1843, p. 602, pl. lxxii, figs. 1-3.—Sowerby, Conch. Icon., XVI, 1868, pl. iii, fig. 8.—Clessin, Conch. Cab. Ano., 1875, p. 202, pl. lxix, figs. 2, 3.—Simpson, Syn., 1900, p. 935.

Platiris (Mycetopus) ventricosus Lea, Syn., 1852, p. 56; 1870, p. 90.

This differs from the other species in being very inequilateral. The dorsal and ventral outlines are nearly straight and parallel; the general outline is decidedly rhomboid.

Group of *Mycetopoda soleniformis*.

Shell large, rounded in front, but somewhat truncated on the lower anterior part: base line evenly incurved; posterior ridge well developed, curved, truncate on posterior slope; beaks central.

Animal that of the genus.

MYCETOPODA SOLENIFORMIS d'Orbigny.

Shell large, elongated, rhomboid, almost exactly equilateral, subinflated, brown-green; beaks but little elevated; hinge line straight; base line somewhat sinuous, being incurved at and behind the middle; anterior end produced near the dorsal line, cut away decidedly below; posterior end obliquely subtruncate, somewhat biangulate below, ending in a point at its base; posterior ridge double, the lower one high and sharp; surface with strong growth lines, with radial lines in the middle: nacre blue.

Length 224, height 56, diam. 30 mm.

Bolivia; Peru.

Mycetopoda soleniformis d'ORBIGNY, Guer. Mag., 1835, p. 41. —CHENU, Ill. Conch., 1858, pl. 1, figs. 1, 1*a*, 1*b*.—SIMPSON, Syn., 1900, p. 935.

Platiris (Mycetopus) soleniformis LEA, Syn., 1838, p. 34; 1852, p. 56; 1870, p. 90.

Mycetopus soleniformis REEVE, Conch. Syst., I, 1841, p. 125, pl. XCIV.—d'ORBIGNY, Voy. Am. Mer., 1843, p. 601, pl. LXVI. —H. and A. ADAMS, Gen. Rec. Moll., II, 1857, p. 505; III, pl. CXVIII, figs. 2*a*, 2*b*.—CHENU, Man., 1859, II, p. 147, fig. 725.—REEVE, Elements of Conch., II, 1860, pl. XXXII, fig. 181*a*, *b*.—SOWERBY, Conch. Icon., XVI, 1868, pl. 1, fig. 1.— CLESSIN, Conch. Cab. Ano., 1875, p. 201, pl. LXVIII, fig. 1.

Mycetopus solenoides SOWERBY, Conch. Man., 1839, fig. 151.

A magnificent species, the largest and finest of the genus. The location of the beaks almost midway between the anterior and posterior ends, and the high, sharp, double posterior ridge are characters that separate it decidedly from all other species.

ADDENDA et CORRIGENDA.

Page 101, To the synonymy of *Lampsilis lienosa* add:
Eurynia (Micromya) lienosa ORTMANN, Ann. Car. Mus., VIII, 1912, p. 340.

Page 180, Dele the last six lines. They will be found on page 281.

Page 230, Line 16 from top read *calimatorum*.

Page 289, Lines 1 and 7 from the top, read *grandensis*.

Page 348, Line 11 from top read *shæfferianus*.

Page 492, To synonymy of *Alasmidonta* add:
Alasmodon SWAINSON, Tr. on Mal. 1840, p. 382.

Page 573, To the synonymy of *Unio batavus* add:
Unio stevenianus DROUET, Unionidæ Russ., 1881, p. 14; Supp. Un. Serbie, 1884, pls. I, II.

Page 583, To *Unio monceti* add:
Var. *ruber* Germain.

"Typical in form; shell of a magnificent, brilliant red; nacre bright rose-salmon, very iridescent." (Germain.)

Type locality, Entebe, Lake Victoria-Nyanza.

Unio monceti var. *rubra* GERMAIN, Bull. Mus. Hist. Nat., 1906, p. 306.

Page 630, To the synonymy of *Unio jayensis* add:
Unio leonensis "B. H. WRIGHT" SIMPSON, Pr. U. S. Nat. Mus., XV, 1892, p. 419, pl. LXII, figs. 3, 4.

Page 730, Dele last five lines and first eight lines on page 731. See p. 1142.

Page 732, Dele line 4 from top.

Page 779, To synonymy of *Pleurobema nux* add:
? Unio placidus KUSTER, Conch. Cab., Unio, 1861, p. 262, pl. LXXXVIII, fig. 2.

Page 988, To the synonymy of *Nodularia bonneaudi* add:
Unio bonneaudi HANLEY and THEOBALD, Conch. Ind., 1876, p. 22, pl. LXVI, figs. 5, 6.

Page 1068, *Physunio friersoni*. While this work was going through the press, Mr. L. S. Frierson called my attention to what had been overlooked in compiling the Synopsis, viz., that the name of *velaris* for a *Unio* was used by Hanley in 1856. Sowerby's name for this species must, therefore, be changed and I propose that of *friersoni* in its place.

Page 1166, To the synonymy of *Lamellidens marginalis* add:

Unio marginalis anodontina HANLEY and THEOBALD, Conch., Ind., 1876, p. 19, pl. XLII, fig. 7.

Unio zonatus DESHAYES, Enc. Meth., II, 1827, p. 587.

Unio marginalis zonata HANLEY and THEOBALD, Conch. Ind., 1876, p. 20, pl. XLIV, fig. 2.

Lamellidens marginalis zonatus PRESTON, Rec. Ind. Mus., VII, 1912, p. 305.

Preston, (l. c.), considers the latter form worthy of varietal rank.

Page 1170, *Lamellidens burmanus.* The name *pulcher* having been previously used in *Unio* by Lea, I change the name as above.

Page 1175, To the synonymy of *Lamellidens generosus* add:

Unio generosus angustior HANLEY and THEOBALD, Conch. Ind., 1876, p. 22, pl. XLVI, fig. 7.

Page 1313, To the synonymy of *Spatha* add:

Mitriodon ROCHEBRUNE, Bull. Mus. Hist. Nat., 1904, p. 461.

Page 1363, To the synonymy of *Mutela plicata* add:

Mutela plicata CLESSIN, Conch. Cab., Ano., 1873, p. 195, pl. LX, figs. 1, 2.

Page 1378, After line 5 from the top add:

The following are unfigured species of *Pleiodon*:

Pleiodon diolibanus BOURGUIGNAT, Moll. Egypt et Ab., 1879, p. 47.

Pleiodon elongatus BOURGUIGNAT, Moll. Egypt et Ab., 1879, p. 47.

Pleiodon letourneauxianus BOURGUIGNAT, Moll. Egypt et Ab., 1879, p. 48.

Page 1401, To the synonymy of *Leila esula* add:

Anodonta gigantea KUSTER, Conch. Cab., Ano., 1853, p. 6, pl. 1, fig. 1.

Page 1405, Dele lines 7 and 8 from the top.

Page 1460, Line 13 from bottom read *æquatorialis.*

Date of publication, August 1, 1914.

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